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A HISTORY OF
BRITISH BIRDS

BY

HENRY SEEBOHM

VOLUME THE THIRD

A HISTORY OF

BRITISH BIRDS

WITH

NOTES ON THEIR CLASSIFICATION AND GEOGRAPHICAL DISTRIBUTION

ALSO

SIXTY-EIGHT COLOURED PLATES OF THEIR EGGS

BY

HENRY SEEBOHM

AUTHOR OF

"SIBERIA IN EUROPE," "SIBERIA IN ASIA," ETC. ETC.

IN FOUR VOLUMES

VOLUME THE THIRD

LONDON

JOHN C. NIMMO

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INTRODUCTION.

THE HISTORIANS OF BRITISH BIRDS.

Ornithologists may roughly be divided into four classes, according to the four points of view from which they study birds. The ideal ornithologist studies his favourite science from every point of view; but unfortunately the men to whose ornithological work this chapter is devoted have been by no means ideal students, and, with scarcely an exception, they will be found to fall naturally into one or other of the four following groups:—First, those who study the bodies of birds in the dissecting-room; second, those who study the skins of birds in the museum; third, those who study ornithological literature in the library; and, fourth, those who watch living birds in their native haunts. Of these the morphologists (the men who form the first group) are more especially a class apart: to them we must ultimately look for a true classification of birds; but this is a work of the future, though much progress has been made in this department since the theory of the gradual evolution of species, in consequence of the accumulated results during many generations of descent with slight modification, has been generally accepted. To be a good ornithological morphologist it is necessary to have a knowledge of the morphology of all vertebrate animals and to know something of that of the invertebrates. The widely different branches of morphology are so complex, that in the present state of the science it requires a lifetime devoted to each before reliable results can be anticipated; and we must look forward to a second generation of morphologists, working on evolutionary lines, before the discrepancies in the views of the various specialists can be collated and sufficiently harmonized to make a classification of birds possible. Anatomists will find abundant fields of labour to illustrate or correct the conclusions which Huxley has drawn from a study of the bones of the palate. We want half a dozen other Huxleys to study and compare other parts of the skeleton with the same care and judgment. It cannot be supposed that Nitzsch has exhausted the lessons to be learnt from a contemplation of the various plans in which the feathers are distributed on the surface of birds. Garrod

and Forbes both died too early to have mastered the mysteries of the muscles of birds. The vocal organs, the nervous system, and the digestive apparatus must be studied more profoundly, to say nothing of the importance of a better knowledge of embryology and many minor branches of morphology, before ornithologists can agree upon a classification of birds. Before finally dismissing the subject, however, it may not be out of place to allude to one point of view which seems in danger of assuming a position almost too exclusive. Since the acceptance of the theory of evolution, morphologists have somewhat changed their ground, or at least think they have. Their sole aim appears now to be the discovery of the pedigree of plants and animals, whereas formerly arguments based upon the study of morphological facts were either attempts to discover a vague and mysterious "System of Nature," or to find out the design or purpose which the multitudinous variations of structure were intended to fulfil. It is often assumed that teleology was exploded by the adoption of the theory of evolution; but it seems to me that all evolution has proceeded on a teleological basis. What I wish to impress upon the reader is the great fact, that though the classification of birds is a subject of the most profound interest and is, in other words, the discovery of their phylogenetic relations, it is, after all, only the foundation on which the science of ornithology is to be built. The history of birds is not completed when the details of their pedigree have been unravelled, as some writers on the subject seem to think: all that has been done is to clear the way for the real work by a preliminary chapter.

We may therefore leave the question of the classification of birds to the decision of the future, and, whilst recognizing its supreme importance, regard it as a subject somewhat outside the scope of our present inquiry.

The progress of ornithology in Britain may be conveniently studied in periods—the first comprising a century, the second half a century, and the third, fourth, and fifth each a quarter of a century.

1660–1759. The former date may conveniently be accepted as the commencement of the historical period of British ornithology, it being the twenty-fifth year of the life of Francis Willughby, the earliest ornithologist of our islands whose works are known. Six years later appeared the earliest known list of British birds, which is contained in 15 small pages in Merrett's 'Pinax Rerum Naturalium Britannicarum;' but this period of a hundred years is chiefly remarkable for the appearance, in 1676, of a Latin work, which was issued two years later in an English dress, 'The Ornithology of Francis Willughby, by John Ray.' This book is not exclusively confined to British birds; and though its interest is now chiefly archæological, it contains abundant evidence of an extended knowledge of birds, and a deep interest in their habits, not only on the part of the two authors,

but on that of many correspondents in various parts of the country, of whom Sir Thomas Brown, of Norwich, Francis Jessop, of Broom Hall near Sheffield, and Ralph Johnson, of Greta Bridge in Teesdale, are specially worthy of note. In 1738–40 Albin's 'Natural History of Birds' appeared, and in 1743–60 Edwards's 'Natural History of Birds' and 'Gleanings of Natural History' followed—quarto works, with coloured plates of divers degrees of merit. Neither of these works professes to be exhaustive, nor are the birds treated of arranged in any order; the subject is viewed from the museum rather than from the field point of view; but many of the plates, especially those of Edwards, are interesting and sufficiently accurate to determine the vague diagnoses of subsequent writers.

1760–1809. The half-century between these two dates was a very eventful one in British ornithology. The appearance of such important works on the birds of the world as the various editions of the 'Systema Naturæ' of Linnæus (1735–1766), the 'Ornithologia' of Brisson (1760), and the 'Histoire Naturelle des Oiseaux' of Buffon and Montbeillard (1770–1783), followed by the publications of their British rival Latham, the 'General Synopsis of Birds' (1781–1801) and the 'Index Ornithologicus' (1790), placed the study of ornithology on a much more systematic basis than had been previously possible. But the influence on the study of birds in the British Islands of these celebrated publications was small compared with that of two unambitious books which, in spite of their apparent insignificance, have brought more recruits to the study of British ornithology than any works which have appeared either before or since. In 1789 the first edition of Gilbert White's 'Natural History of Selborne' captivated the British public by the simple charm of the unaffected love of Nature which breathes in every page; whilst in 1797 the first edition of Bewick's 'History of British Birds' fascinated them by the artistic excellence of its little woodcuts in spite of the poverty of its letterpress. During the half-century unimportant works on British birds were written by Walcott (1789), Donovan (1794–1819), Lewin (1796–1801), and Turton (1807), in addition to local faunas; but two books deserve special notice. In 1766 the large folio edition of Pennant's 'British Zoology' was published—a book remarkable for the accuracy of its coloured plates and of its too short text, which derives an additional interest from the fact that its author was one of the two ornithologists to whom Gilbert White addressed his celebrated letters on the Natural History of Selborne. The other important work on British birds of the half-century was Colonel Montagu's 'Ornithological Dictionary' (1802–13). The value of this book is somewhat marred by its alphabetical arrangement; but it is the work of a "field ornithologist," and contains much valuable detail, the result, for the most part, of original observation.

1810–1834. During the next quarter of a century ornithology was by

no means neglected. The fourth, fifth, sixth, and seventh editions of Bewick were published, and the fifth to the twelfth editions of Gilbert White. Several works of more or less excellence on British birds appeared, written by Graves (1811–21), Hunt (1815–22), Selby (1821–33), Fleming (1828), and Mudie (1834). Various contributions to Loudon's 'Magazine of Natural History' and other periodicals testify to the interest felt in local ornithology, whilst the attention of British naturalists was drawn to the birds of North America by the works of Wilson, Audubon, and Swainson; nor must the influence of the writings of Temminck and Cuvier and other continental authors be overlooked.

In 1831 and during the five following years Hewitson published the first edition of his 'British Oology.' The plates are good, but several of the eggs are incorrect and the letterpress is very meagre.

The close of this period was marked by the commencement of two important undertakings, the 'Proceedings' and 'Transactions' of the Zoological Society of London, and the series of large folio illustrated works of John Gould. But by far the most important work of this or any other period was the publication of Naumann's 'Birds of Germany,' which was commenced in 1820 and completed in 1844. Twelve octavo volumes of about 600 pages each testify to the industry of the writer, whilst a careful study of the contents proves him to have possessed a knowledge of the various plumages of the birds of which he treats, their habits, songs, call-notes, food, and all the numerous details of their history, which a lifetime devoted to their observation was able to teach, not only unrivalled by any author before or since, but far above and beyond all hope of rivalry. Naumann was not a compiler in any sense. Want of daily access to a good library or a well-furnished museum made the synonymy of the work imperfect and the geographical distribution incomplete; but, with the exception of the breeding-habits of birds which retire to the Arctic regions for this purpose, he has left little unsaid for after writers to record. Had his work only been translated into English, half the nonsense that subsequent ornithologists have written on birds would never have appeared.

1835–1860. Ornithology made rapid strides during the next quarter of a century; at least a dozen new editions or reprints of White's 'Selborne' were issued, and the eighth and last edition of Bewick appeared in 1847. The latter work was thenceforward superseded by Yarrell (1837–43) and Morris (1850–57). The woodcuts in the former work are far inferior to those of Bewick in artistic merit; but they have a charm of their own, especially to those who appreciate high finish. The letterpress contains but little original matter; but it is compiled with considerable judgment. It is obvious that Yarrell's personal acquaintance with birds was small, though he was furnished with much valuable information from Bond

and others; but the attractions of the woodcuts have been sufficient to carry the work through several editions. Morris's 'History of British Birds' owed its success to its coloured plates: it contains abundant internal evidence that its compiler was much less acquainted with "field-ornithology" than was even Yarrell; and the second edition, published in 1870, shows that the writer was either ignorant of the contemporary literature in which the important discoveries of Wolley and others were recorded, or did not choose to incur the expense of setting up fresh type to incorporate them in his later editions. Nevertheless it would be unjust to refuse to the original publication the merit of being a useful compilation. Jenyns (1835), Meyer (1835–43), and Jardine (1838–43) each contributed works purporting to be complete histories of British birds, and to the last-mentioned author must be accorded the merit of considerable originality. But by far the most original work on British birds which has yet appeared was that written by Macgillivray (1837–52). This work is deficient in many respects; as a compilation it must be regarded as a failure, but where the writer speaks of the habits of birds which have come under his own observation he is unrivalled. Macgillivray is the Naumann of British ornithologists, and his book will be regarded as a classic when his contemporaries are forgotten.

Knox's 'Ornithological Rambles in Sussex' (1849) and Thompson's 'Birds of Ireland' (1849–51) deserve a passing mention, nor must the numerous minor notices relating to ornithology which appeared in the magazines of the day be altogether forgotten, especially as in 1843 the 'Zoologist' was commenced for the reception of many of them. Of all the contributors of this kind perhaps Waterton and Blyth were the most remarkable; and although the subsequent labour of the latter writer was chiefly devoted to Indian ornithology, his name will always live in the memory of British ornithologists as the writer of the one edition of White's 'Selborne' in which the footnotes are equal, if not superior, to the text.

But in spite of all these great names, the greatest has yet to be mentioned. In 1856 the third edition of Hewitson's 'Eggs' was published, with new and somewhat improved plates, and with extracts from the letters and journals of John Wolley, whose discoveries of the habits, especially the breeding-habits, of birds which migrate in the spring to the Arctic regions have been so often enthusiastically spoken of in every volume of my book, that further praise of the love which prompted the enterprise, or the pluck which carried it to a successful issue, is superfluous.

1861–1885. If it was necessary to give names to the various periods into which the history of ornithology in this country may be conveniently divided, perhaps the last quarter of a century might be called the Darwinian era; but it would be a misnomer. Although the 'Origin of Species' was published in November 1859, its influence upon ornithology in this country

is only now beginning to be felt. Darwin's great works, and the almost equally great works of Wallace, fell upon the ornithological world during an era of scholastic pedantry. Ornithologists were too busy species-making or, if new species could not be found, in genera-making to take the lessons of evolution to heart. Most of them accepted the doctrine in theory, but never thought of applying it to the study of birds. The old notions of the distinctions between species still prevailed, and the antiquated rules for the diagnosis of genera still held sway. But whilst in these important questions the most rigid conservatism barred all progress, a vent was found for the revolutionary tendencies of the age in the most startling changes in nomenclature: familiar names were changed and re-changed in obedience to the law of priority—a Will o' the Wisp which has led ornithology into a quagmire of confusion; whilst another fetish, binomial nomenclature, proved to be equally an *ignis fatuus*, which so blinded the eyes of ornithologists that they could not see the intergradation of species, the most important ornithological fact which has been discovered in the last quarter of a century.

But in spite of these untoward influences, much good work was done. In 1859 'The Ibis' was commenced, a publication entirely devoted to ornithology, a periodical which may fairly claim to be regarded as second to none of its kind. Amongst the founders the names of Eyton, Gurney, Newton, Salvin, Sclater, and Tristram will specially be connected with important bird-work of various kinds. For ten years 'The Ibis' appears to have absorbed the literary talent of British ornithologists, though the first two volumes of Stevenson's 'Birds of Norfolk' (1866–70) deserve especial mention as a model of a local fauna. Harting's 'Birds of Middlesex' (1866) appeared about the same time, and was followed by many other works of a similar character by Gray, Cordeaux, Hancock, Saxby, &c. Gould's 'Birds of Great Britain' (1866–73) almost approaches in the exquisite softness of its plates the delicacy of the living bird, and is specially remarkable for the number of young figured, and one can only regret that the letterpress should be so poor. White's 'Selborne' maintained its popularity during this period, and at least half a dozen important new editions were published.

The pretty woodcuts of Yarrell's 'British Birds' were able to float a second edition in 1845 and a third in 1856; and in 1871 the publisher engaged Professor Newton to bring out a fourth edition, and for ten years it slowly appeared at ever-increasing intervals without half having been completed, when Van Voorst's patience was exhausted, and the rest of the work was placed in the hands of Mr. Howard Saunders, by whom it was promptly brought to a close in 1885. During the fourteen years that this edition was in progress, so many discoveries were made, especially in the geographical distribution of the species treated of, and the

whole aspect of the study of ornithology was so changed by the fact that scientific men had in the meantime begun to consider the subject from the evolutionary point of view, that the earlier portion is already out of date, and the latter, being almost necessarily finished on the same lines, is to a considerable extent open to the same charge. The homogeneous character of the work has been remarkably well preserved, even to its faults *, and its reputation for accuracy creditably maintained. It is to be regretted that neither editor recognized the importance of the fact of the intergradation of species, which is in many instances clearly demonstrated by a glance at a large series of skins from different localities—a fact which American ornithologists have pointed out in the Nearctic Region, and which I have endeavoured on many occasions to show is quite as obvious in the Palæarctic Region †. The progress of young birds to maturity, with the

* To the present writer the attempt to avoid the charge of egotism, or at least to veil the personality of the author by carefully abstaining from the use of the personal pronoun, always appears to be a failure. The custom is quaint, not to say archaic; but the author ventures to think that it is more suitable to the irresponsible utterances of the anonymous writer of the leading articles of a newspaper than to the expression of opinion, or the narration of facts, in a scientific work. Nor can the present writer approve of the practice of composing complicated Gladstonian sentences, so framed as to admit of several constructions, in order that the author may hereafter claim a recognition of his acumen in having discerned the many-sidedness of truth. Still less can he pardon the custom of "playing for safety" by the expression of an opinion, which is probably correct, whilst carefully avoiding a statement of the grounds upon which the opinion is formed, because the chance of their being wrong is so very much greater. The days of authority in science as well as in religion are past. Modern students look for arguments, not opinions; what they want are facts, and they will be grateful to any writer who provides them. If the language be simple and the meaning clear, they will not stop to inquire whether the writer be self-conscious of his egotism or not; and if ignorance be candidly confessed, they will thank the writer who thus suggests a useful field of labour, without losing time in forming an opinion of his reputation for learning, which is a matter of little or no consequence.

† In the Introduction to my first volume I endeavoured to show the important part which interbreeding plays in the evolution of species; but I appear to have done it so clumsily that my American critics have completely misunderstood the point ('Auk,' 1885, p. 89). Cross-breeding between different species is a very unimportant part of the subject, as it seldom results in fertile offspring. Interbreeding is of the greatest importance when it takes place between different races or incipient races of the same species. Where the area of distribution is very wide it often results in a series of forms which intergrade with each other. Where the area of distribution is small it prevents every little valley setting up a race of its own, as happens with so many species in the Pacific Islands, for example, where an extended area of distribution has been cut up into many small but interrupted areas of distribution, so that interbreeding between the inhabitants of one and those of another cannot take place. It is a remarkable fact that the importance of interbreeding is as obvious in the vegetable as well as in the animal world, many plants having acquired quite complicated mechanical contrivances to prevent self-fertilization and insure interbreeding.

remarkable difference between one family and another in the date, duration, and number of the annual moults, so ably pointed out by Naumann, Macgillivray, Adamson, and others, are in too many cases ignored; but in many respects it reflects credit on both editors.

Whilst the fourth edition of Yarrell was in course of publication a still more ambitious work appeared, Dresser's 'Birds of Europe' (1871–81). I have had occasion to correct so many errors in Dresser's book, that I have pleasure in being able to say that it must, in my opinion, be regarded as one of the most successful ornithological compilations which have been published, though it is the compilation of a writer whose personal knowledge of birds appears to be very small, though his opportunities of acquiring it have been large. An accurate acquaintance with the numberless details which comprise the habits of birds can only be acquired by committing them to paper on the spot.

It is a remarkable fact that whilst on the continent of Europe the greater number of ornithological publications are the works of various officials—doctors, professors, or what not—attached to the Government Museums, in the British Islands the principal work has been done by amateurs. A history of the study of ornithology in Great Britain would, however, be incomplete without a mention of the works of the present and the late ornithological curators of the British Museum. Gray's 'Genera of Birds' (1844–49) and his 'Hand-list of Birds' (1869–71) are too useful, with all their faults, to be entirely ignored. Few living ornithologists have done more work or had a more beneficial influence in directing the work of others than R. Bowdler Sharpe. When his 'Monograph of the Kingfishers' appeared (1868–71) the ornithological world was startled to find how valuable a work it was possible for a young man (he was only 18 when the first number appeared) to compile. It was Sharpe who planned Dresser's 'Birds of Europe,' and put it into working order, on the same lines as his 'Kingfishers;' and 'The Ibis' and the 'Proceedings of the Zoological Society' abound with valuable contributions from him on the birds of South Africa, Borneo, &c. But the reputation of Sharpe will rest on his great work, the 'Catalogue of Birds in the British Museum,' a monograph of the birds of the world, of which he has already produced seven volumes. From its nature it is purely museum work—synonymy and skins, an index to the literature of each species, a description of the various plumages of each, a key to the genera of each family and to the species of each genus, and a brief summary of the geographical distribution of each. Like most other good work in this world, it is the evolution of order out of chaos.

Harting's 'Handbook of British Birds' (1872) is valuable for its lists of the various alleged occurrences of the rarer species. John's 'British Birds' (1874) is perhaps the best cheap book on the subject.

Booth's 'Rough Notes' (commenced in 1881 and not yet completed) possesses the merit of originality. It is not in any sense a compilation, and displays much evidence of personal acquaintance with the birds he describes, though to some extent it is the work of a sportsman rather than of an ornithologist. Numerous interesting facts connected with the habits of birds are recorded, and much light is thrown upon the changes of plumage of many species. The plates are drawn from the author's collection of birds in his museum at Brighton, which must be regarded as the most interesting collection of British birds ever made, not only from the fact that they were all obtained by Mr. Booth in the British Islands, but also from the beauty of the mounting, both of the birds themselves and of their surroundings. A somewhat similar collection is in process of formation in the balconies of the central hall of the Natural History Museum at South Kensington. Under the superintendence of Dr. Günther this small feature of one of the departments of the British Museum promises to be an oasis of interest in a desert of dry detail.

No review of a history of the study of ornithology in the British Islands would be complete without a mention of Gätke, the veteran ornithologist of Heligoland. Gätke is a German, and Heligoland, though under British rule, is, geographically speaking, German also; but the subject of migration has been so favourite a one with British ornithologists from the time of Gilbert White down to our own, and Gätke's observations are principally those of migrants on their way to our shores, that it would be an unpardonable omission to be silent on the subject. It is profoundly to be regretted that the detailed results of forty years' study of the migrations of birds and their changes of plumage * should still be unpublished; but genius must be allowed to do things in its own way. The glimpses that ornithologists have had of Gätke's work in his communications to 'The Ibis' &c. warrant the expectation that the new era about to commence will produce at least one work worthy of the age; but it would be a curious irony of fate if the greatest work of the Darwinian period should be written by an anti-Darwinist!

The most remarkable fact connected with all this voluminous literature is that so little of it rises above the dead level of mediocrity. Of the score or more authors who have written books on British birds, in the race for fame Macgillivray wins in a canter, Montagu comes in a bad second, whilst

* With the exception of Macgillivray, Selby, and perhaps one or two others, British ornithologists have neglected to discriminate between young in first plumage, birds of the year, and, in the case of those birds which moult twice in the year, the partially adult plumage which is assumed after the first spring moult. This slovenly mode of treating the subject is quite as conspicuous in the most recent publications, although special attention has been called to these important details by such accurate observers as Adamson and Booth.

the rest are nowhere. It will scarcely be disputed by any competent and impartial judge that Macgillivray stands alone as the solitary genius in the list; but even the great Scotch ornithologist can never be compared with Naumann, at least in the result of his work. We must, however, remember that the father of German ornithology enjoyed exceptional advantages; not only did he inherit from a long line of ancestors the "deutsche Gründlichkeit," with which "English thoroughness" cannot compete, because the former has developed into head-work and the latter into hand-work, but he inherited from his father a special taste for ornithology, and reaped the fruits which his father had planted.

In speaking of Macgillivray in such high terms, I am not unmindful of the writings of Wolley. If an ardent love of a subject, indomitable energy in its pursuit, and average ability in describing the details of discovery be regarded as proofs of genius, then Wolley was a genius; but his ornithological career was suddenly closed before the world knew that it had begun. Wolley has never had justice done him. If the 'Ootheca Wolleyana,' of which a fragment appeared twenty-one years ago, had ever been finished, the ornithological world would be in a much better position to form a correct opinion of the greatness of their debt to him. No valid reason has ever been assigned for the delay; but possibly Newton was shipwrecked on the rocks upon which I myself have nearly foundered—namely, the impossibility of obtaining by the aid of chromolithography a satisfactory representation of a bird's egg, either in consequence of incapacity to draw correctly, to colour truly, to gradate the shade evenly, to print carefully, and to register accurately, or from inability to overcome the mechanical difficulties connected with the process.

It is very easy to find fault with the ignorance and carelessness of others, to grieve over their pedantry in the matter of nomenclature and wrong-headedness in the matter of genera, to marvel at their blindness on the question of the intergradation of species or their inability to see straight on the question of classification, to lament their indifference to the interesting points connected with the moulting of birds, the changes which take place in the colour of the feathers themselves, or the series of plumages which intervene between the newly hatched young and the fully adult. It is very easy to express one's profound disappointment at the uninteresting character of one History or the prosy style of another, but it is quite a different thing to write a book which shall not be open to criticism of the same kind. It is difficult to estimate the extent of one's own ignorance until an attempt be made to transfer one's knowledge to paper, and then to compare it with the work of Macgillivray or Naumann, and discover what a profusion of facts, personally known to these writers, one is obliged to quote at second-hand. In my own work I have tried to

the utmost of my ability to take my facts from Nature herself, and I have travelled far and wide in the endeavour to find them for myself instead of copying them from books. The imperfections of my book are not due to want of taking pains, though it has been finished in three years. Much of it has been copied from old journals, written from time to time amidst the scenes described; but of course a considerable portion has necessarily been compiled from the works of others, and to no one am I more indebted than to the giant of ornithology, the great Naumann. The principal materials have been collected in Europe. Three seasons spent in the Arctic Region, one in Norway, one in East Russia, and one in Central Siberia have given me an opportunity of seeing many birds in their breeding-grounds which visit us only in winter. Three summers in the south of Europe, one in Asia Minor, one in Greece, and one in the valley of the Danube have made me acquainted with many of our rarer visitors, which have also been watched during the breeding-season in Holland, Jutland, Brunswick, Pomerania, and other parts of Germany, not to mention a flying visit to Canada and the United States. A residence of five-and-twenty years within a short distance of Sherwood Forest on the one side and the Derbyshire Moors on the other, varied with repeated trips to Flamboro', the Farnes, and the Bass Rock, has made me familiar with our common birds. No one can appreciate more than I do the charms of what is technically called "field ornithology," and no one can appreciate more than I do the difficulty of transferring this charm to paper. That I have not been able to reproduce more of it is my greatest regret. I have taken a great deal of trouble to avoid blunders; but with all my care many have crept in, though I hope not very important ones. The acquisition of Swinhoe's collection of Chinese birds added to my Siberian skins gave me an exceptionally good opportunity of discovering the intergradation of many supposed species, though I afterwards found out that American ornithologists had long ago investigated the fact and devised a system of nomenclature to recognize it. I have endeavoured to give to this inevitable result of the process of evolution the importance it deserves. One of my chief aims has been to decoy the reader from the provincial or insular point of view from which ornithology has been regarded by too many of its lovers in our islands, and to endeavour artfully to make their ornithological tastes more cosmopolitan. Against two crying evils in the study of my pet science I have set my face resolutely. In my endeavours to cover them with ridicule and contempt I fear I may sometimes have given offence. If I have done so, I beg to apologize most sincerely. I have not the slightest ill-feeling against any ornithologist personally; my quarrel is with the errors which have seduced them. The two great errors to which I allude are the wanton multiplication of genera and the capricious change of generic and specific names. Both evils make the study of ornithology impossible, except to persons of

exceptional powers of memory, and the former destroys the value of the important lessons to be learnt from the geographical distribution of genera. I must plead guilty to one more cause of indignation, namely, the publication, with more or less trumpet of authority, of careless, slip-shod, slovenly work; but the special case to which I allude is of such a character that even indignant criticism does not require any apology. I have done my best to stem the revolutionary torrent which threatens to sweep away the ancient landmarks of ornithological nomenclature; and I can only leave the results in the hands of my readers, trusting in the eventual triumph of common sense over pedantry.

I remember a few years ago having a long talk with a celebrated ornithologist who presided over one of the most important continental museums. We discoursed on evolution, in which my learned friend did not believe, and on various other subjects—ornithological, anthropological, and geographical, until finally I was gravely informed that all these questions had been exhaustively treated of in the manuscripts which my friend intended to leave in the hands of his executors, and that after their publication no further books on science would be necessary! It seems inconceivable that ignorance almost as grave could exist in our own country; but I was once seriously told by an enthusiastic admirer of the 'Catalogue of Birds in the British Museum' that ornithology was nearly played out, and that when that voluminous work was completed there would be little or nothing left for ornithologists to do! It is impossible to overestimate the fathomless abyss of ignorance in which learned scientific men are content to dwell.

No doubt in a few years my work will be superseded by a far better one. If ornithology makes as rapid strides in the next quarter of a century as it has done in the last, we may expect great things. Light is beginning to dawn on the classification of birds, now that their bodies and not merely their skins are studied. When the almost inexhaustible riches of this mine are explored, perhaps the habits and instincts of birds may be more studied. Birds are alive. The highest development of life is mind. When the mental condition of birds has been scientifically studied, it will be found that the true history of a bird includes not only that of its body from the embryo onwards, not only that of its skin from youth to adult, not only its geographical distribution and the literature which treats of it, but consists *par excellence* of its habits and the instinct or reason which rules them.

The scientific world is beginning to see straight on this subject, thanks to the labours of Mr. Samuel Butler, who, in spite of much opposition, has placed the facts in such a clear light that they carry conviction with them, so that even his opponents are gradually accepting his views without admitting it, and drifting unconsciously into his very phraseology.

It seems now almost possible to form some scientific conception of the history of a bird. One can picture the little Willow-Wren, for example, basking in the winter sunshine of an oasis in the Sahara for the first time in his life, silently feeding on the insects that abound on the palm-trees, the figs, the vines, the olives, the almonds, and the pomegranates of the south. One can imagine that he has almost forgotten the terrors and the fatigues of the long journey from Yorkshire, and looks back upon them as on a dream. But as spring comes on, the merry cheerfulness of his life begins to cloud over, he feels languid and ill and out of spirits because he has begun to sicken for his first moult. His plumage begins to look shabby, and the life seems to have died out of his feathers; half his appetite is gone, and he sulks for hours on some sheltered perch, wondering what is the matter with himself. But as his new feathers begin to appear, new life returns to his system, his appetite comes back again, every day he grows stronger and stronger, and his nervous dread of being seized by the Hawks, which are ever on the watch for weakly birds, leaves him. When his new dress has grown perfect in all its glossy silkiness he exults in his pride of beauty and health; but he does not return to his easy happy winter-life. He is overflowing with health and high spirits; but new feelings are springing up in his little breast, the first dawnings of sexual affection, and he essays a timid attempt at a song. But the course of his true love does not run smooth. Somehow or other he knows that he must again brave the long journey that he made in the autumn. He has inherited some dim memory of the arid summer of the Sahara, and a still clearer notion of his duty to leave it before food becomes scarce. All at once the beautiful oasis has lost its charms for him; he cannot satisfactorily associate the idea of love with Africa; he has grown restless and home-sick, and go home he must, and does.

Fifteen hundred miles, as the crow flies, away to the north, the leaves are just coming out on the oak trees that shelter the bilberries and the heather down by the beck-side in the remnant of the old Yorkshire forest where our little Willow-Wren was born. A cold east wind rattles through the branches of the trees; but under the shelter of a thick bough of evergreen Scotch fir a little bird sits silently on a slender twig. It is our little Willow-Wren, tired and sad after his long journey, and he "has had enough to make him sad if only he recollects it; and if he can recollect his road from Morocco hither, he, may be, recollects what happened on the road; the long weary journey up the Portuguese coast and through the gap between the Pyrences and the Jaisquivel, and up the Landes of Bordeaux and through Brittany, flitting by night and hiding and feeding as he could by day; and how his mates flew against the lighthouses and were killed by hundreds, and how he essayed the British Channel and was blown back shrivelled up by bitter blasts, and how he felt nevertheless that

that was water he must cross, he knew not why; but something told him that his mother had done it before him, and he was flesh of her flesh, life of her life, and had inherited her instinct (as we call hereditary memory in order to avoid the trouble of finding out what it is and how it comes). A duty was laid on him to go back to the place where he was bred; and now it is done, and he is weary and sad and lonely"*.

But his sadness is short-lived. Food and sunshine quicken the blood in his veins, and in a couple of days his merry song, like a little peal of bells, enlivens the woods from sunrise to sunset, as he vies with his brothers who swarm around him as to who can sing the loudest and the sweetest. A week later the female Willow-Wrens arrive, and courting and wedding are the order of the day, with, perchance, a fight or two before everybody is happily paired. Then comes the all-important business of nest-building; what consultations are held, what exploring expeditions are made before a safe corner is found! And in the construction of the nest itself, the selection of dry grass for the materials of the case (which must not be cup-shaped like most nests, but must have a roof over it like the hood of a Hansom cab), and the collection of feathers for the lining, not hair as their cousins the Wood-Wrens always use—in all these details who shall say how much of it has to be learnt? surely it is far more likely that most of it is the result of hereditary memory!

And so the life of the little bird goes on; the eggs are laid and duly sat upon and hatched. Every day the bird wanders far into the wood in search of food; but she never forgets the little clump of bilberries and heather where her treasures lie concealed, and however far she wanders she never forgets the way back again. What a wonderful memory she must have! every bush and tree of the forest for miles round must be known to her and her mate. Then the patient way in which the parents teach their young to fly and to feed, the quick way in which the young birds learn—not as if they were learning something new, but more like the recovering of forgotten knowledge—are all deeply interesting facts.

By-and-by the sickening for the autumn moult, the leave-taking and wishing good-speed to the young on their departure southwards on their first migration, led perhaps by one or two restless birds who either have not paired happily that season or have lost their broods early by some accident, and finally the preparations for their own departure follow in regular order. When the long journey is over (this time undertaken more

* The latter portion of this paragraph is a quotation from an article by the Rev. Charles Kingsley in 'Fraser's Magazine' for 1867. The Jaisquivel is a mountain-pass a little to the south of Biarritz beyond Fuenterrabia. It is undoubtedly selected as a route for passing the chain of higher mountains by birds of passage of every kind; but the Spanish sportsmen assert that a still larger number of birds take the Lazarieta route, known as "las Palomeras de Echalar."

leisurely, as no important duties of incubation are pressing irresistibly upon them), and they are once more amongst the dates and pomegranates of the Saharan oasis, the annual cycle is finished, to be repeated with scarcely a variation for thousands of years to come, as it has been for thousands of years in the past.

Some such story as this is the true history of a bird, divined by the keen poetic insight of Kingsley and Butler, and no doubt ten years hence will be accepted by every man of science. The evolution of scientific thought will not come to an end because Darwin did not live long enough to chronicle it.

The pre-Darwinian philosophers regarded man and birds as separate creations, the former endowed with reason and the latter with instinct. Instinct and reason were regarded by them as distinct from each other, as arms were looked upon as being perfectly distinct from wings. Modern biologists have discovered a close affinity between the latter; they have discovered that the arms of a man and the wings of a bird are only modifications of the fore legs of their common ancestor, and there can be little doubt that the reason of man and the instinct of birds are likewise only modifications of some mental power possessed by their common ancestor. If instinct be regarded as distinct from reason, it must be admitted that both faculties are possessed both by man and by birds. The difference between the two faculties would then chiefly lie in this, that if the operator were conscious of the motive for performing an action in a certain manner, it would be regarded as an act of reason; but if the action had been repeated so often that the cause of its performance was forgotten in the fact that it had been so often repeated as to have become a habit, it would be regarded as memory, and where the habit was inherited from an ancestor as instinct. Instinct would thus become a synonym of inherited habit, inherited memory, or, to be still more precise, inherited association of ideas—a faculty common to man and other animals.

ERRATA ET ADDENDA.

Vol. I. p. 368. Since the article on the Reed-Warbler (*Acrocephalus arundinaceus*, Brisson *nec* Newton) was written, I have been informed by Mr. E. W. Wade that he has found this species breeding abundantly in the East Riding of Yorkshire, both at Hornsea Mere and at Castle Howard.

Vol. I. p. 387. Two additional examples of the Barred Warbler (*Sylvia nisoria*) were shot in our islands in 1884—one on the 28th of August at Spurn Point (Slater, 'Zoologist,' 1884, p. 489), and the other on the 4th of September at Cley, on the north coast of Norfolk (Sclater, 'Zoologist,' 1884, p. 493).

Vol. III. p. 28. An undoubted example of the Killdeer Plover (*Charadrius vociferus*) was shot on the 15th of January, 1885, by Mr. Jenkinson, at Tresco, in the Scilly Islands (Cornish, 'Zoologist,' 1885, p. 113).

Vol. III. p. 130. Since the example of the Solitary Sandpiper (*Totanus solitarius*) was recorded as having been obtained on the Scilly Islands, a second has occurred in the same neighbourhood. It was killed on the marsh near Marazion, a few miles east of Penzance (Cornish, 'Zoologist,' 1885, p. 113).

Vol. III. p. 156. Add to synonymy:—Limosa lapponica (*Linn.*), *Gray, List Birds Brit. Mus.* iii. p. 96 (1844).

Vol. III. p. 157, line 20, for *Limosa lapponica uropygialis* read *Totanus rufus uropygialis.*

Vol. III. p. 311, line 17, *for* the Rev. J. W. Waithman *read* the Rev. Gregory Smart.

Vol. III. p. 529, add below Mallard, in key to females:—

Gadwall..... Alar speculum white.

A HISTORY

OF

BRITISH BIRDS.

Family CHARADRIIDÆ, OR PLOVERS.

THE Plovers and their allies are a large group of birds, very nearly allied to the Cranes, and still more closely related to the Bustards; from the latter family they are scarcely separable. Forbes divided them into two families, the Plovers and the Pratincoles, between which he placed the Hemipodes. Sclater divides them into three families, the Sandpipers, the Plovers, and the Pratincoles, to which he adds a fourth, the Stone-Curlews. The notches on the posterior margin of the sternum are usually two in number on each side; but some species are aberrant in this respect, having only one notch on each side—for example, the Woodcock, Great Snipe, Common Snipe, Ruff, Common Sandpiper, and some other species not found in Europe. In the modification of their cranial bones they approach the Game Birds and the Gulls. Gadow regards the Plovers as nearest related to the Gulls and Petrels, a second group being the Cranes and Rails, and a third and perhaps a fourth the Storks and Herons, these groups forming an Order.

In this family, as in the Game Birds, the Bustards, and the Gulls, the young are covered with down when they are hatched, and are able to run almost immediately. Plovers and Sandpipers generally moult twice in the year, in spring and in autumn. The young in first plumage more or less resemble the adults in summer dress. In their first autumn they begin to

change into the plumage of birds of the year, which differs very little from the winter plumage of adults; this is effected principally by a change in the colour of the feathers, only a few of which, the worn-out ones, are moulted. Sometimes the change takes place after migration, but generally during migration. In spring, birds of the year moult into a plumage very nearly resembling the adult summer plumage; but they can generally be recognized by the colour of their wing-coverts, which in birds of the year are in summer plumage; in adults these feathers seem always to be in winter plumage. The quills and tail-feathers are generally moulted twice in the year, in spring and autumn; but possibly some quills or tail-feathers which are renewed in autumn are not moulted again in spring. The change of plumage in autumn takes place principally by the growth of new feathers, which push away and replace the old ones; but if an old feather retain its vitality it is not replaced, but changes colour—the rich summer tints seem to die out, and the grey winter tints to replace them.

Birds of the year apparently moult their feathers or change colour, as the case may be, more slowly than adults; and many of them do not attain the nuptial plumage during their first spring. Possibly these may be late-hatched birds; they not only pass their first summer in immature plumage, making no attempt to pair or breed, but they sometimes remain in their winter-quarters during the whole of their first summer, or if they migrate they stop short of the breeding-grounds, and while away the summer in regions where adult birds are only seen passing through on migration in spring and autumn. (Legge, 'Stray Feathers,' 1873, p. 490; Hume, 'Stray Feathers,' 1874, p. 288; Adamson, 'Some more Scraps about Birds,' p. 47; and Swinhoe, 'Ibis,' 1863, p. 404.)

The birds belonging to this family present a great variety of modifications in their external characters. The two most important are the pointed wings and the unwebbed or partially webbed feet with a minute elevated hind toe, which is sometimes absent. The legs are never very short, and the tail is never long. The toes are sometimes furnished with a scolloped or lobed membrane, resembling those of the Coots and Grebes; and the middle claw is occasionally serrated, as in the Goatsuckers, Herons, Bitterns, Cormorants, and Barn-Owls. The bill is so variable in shape, as to be practically useless as a distinguishing character.

This family of birds is one of the most cosmopolitan, and contains more than two hundred species. About a fourth of these are found in Europe, of which nearly a score breed in our islands, and about thirty more occur accidentally, or more or less frequently on migration.

Genus HÆMATOPUS.

The genus *Hæmatopus* was recognized by Linnæus in 1766 in the 12th edition of his 'Systema Naturæ,' i. p. 257. The Common Oyster-catcher (*H. ostralegus*) was the only species known to the great Swedish naturalist, and is therefore the type.

The Oyster-catchers belong to the group of genera in this family in which the tarsus is reticulated throughout with small hexagonal scales. From the Avocets they may be distinguished by not possessing a hind toe or webbed feet; from the Stilt-Plovers by having the tarsus shorter than the culmen; and from both these groups, as well as from the true Plovers, by the peculiar shape of the bill.

There are nine species of Oyster-catchers, which are distributed almost throughout the world, but only one is found in Europe, and is a resident in the British Islands.

The Oyster-catchers chiefly frequent the sea-coasts, but sometimes inhabit the margins of rivers and large inland sheets of water. They are very wary birds, feeding in small parties or flocks, and generally taking wing the moment they are alarmed. Their flight is very powerful and often long-sustained. They run and walk with great ease along the margin of the water in search of food, and are able to swim. Their note is a loud shrill whistle or pipe. Their food consists of mollusks, sand-worms, and other small marine animals. They breed close to the water, and their nests, in some cases placed only just above high-water mark, are mere hollows scraped in the sand or shingle. Their eggs are three or four in number, buff, blotched, spotted, and streaked with brownish black and grey.

HÆMATOPUS OSTRALEGUS.

OYSTER-CATCHER.

(Plate 24.)

Ostralega ostralega, *Briss. Orn.* v. p. 38 (1760).
Hæmatopus ostralegus, *Linn. Syst. Nat.* i. p. 257 (1766); **et auctorum plurimorum** —*Naumann, Schlegel, Keyserling & Blasius, Gray, Saunders,* &c.
Scolopax pica, *Scop. Ann. I. Hist. Nat.* p. 95 (1769).
Ostralega pica (*Scop.*), *Bonn. Encycl. Méth.* i. p. 26 (1790).
Hæmatopus hypoleuca, *Pall. Zoogr. Rosso-Asiat.* ii. p. 129 (1826).
Ostralega europæa, *Less. Man. d'Orn.* ii. p. 300 (1828).
Ostralegus vulgaris, *Less. Rev. Zool.* 1839, p. 47.
Ostralegus hæmatopus, *Macgill. Man. Brit. B.* ii. p. 59 (1842).
Hæmatopus macrorhynchus, *Blyth, Journ. As. Soc. Beng.* xiv. p. 548 (1845).

The Oyster-catcher is one of the most conspicuous birds to be found on our shores, but is comparatively rare on the low-lying coasts or those which are much frequented. North of Yorkshire and Lancashire, and throughout the entire coast-line of Scotland, it is much more common, and in many localities breeds in abundance. It frequents nearly all the adjacent islands, including the Orkneys, Shetlands, and the Hebrides, and even isolated St. Kilda. It is commonly distributed on the Irish coasts. To the extreme north it is principally a summer visitor, but in winter it is generally distributed on all our shores. Although the Oyster-catcher is *par excellence* a coast-bird, it often wanders inland for some distance. In some parts of Scotland it also breeds on inland lochs and on the banks of large rivers.

The Oyster-catcher is almost cosmopolitan in its range, but appears to be unrepresented in the western portion of the Nearctic Region, the Ethiopian Region, and in the central portion of the Palæarctic Region. The result of this geographical distribution appears to be five pied species, which, though very nearly allied, are not known to intergrade, though it is extremely probable that further researches may lead to the discovery of the missing links, in which case the three Old-World species may have to be degraded to the rank of subspecies.

The West Palæarctic species ranges from the Atlantic to the valley of the Obb. In the western portion of its distribution it is almost exclusively a sea-shore bird, but east of the Black and White Seas it is only found during the breeding-season on the shores of lakes and rivers. It is a regular summer visitor to the coasts of North-west Europe as far north as land extends, and as far east as Archangel; further east it is no longer found on the sea-shore, but ascends the Volga and the Kama, crossing over to the Petchora, on the banks of which river, as also on those of the Obb,

it only ranges as far north as the Arctic circle. It is a summer visitor to the shores of the Baltic, but on the coasts of North Germany, Great Britain, and France it is a resident. In the basin of the Mediterranean it is principally known as passing through on spring and autumn migration; but a few remain to breed in the delta of the Rhone and on the Adriatic coast, where also a few remain during winter. It winters on both coasts of Africa, on the west as far south as Senegambia, and on the east as far south as Mozambique. It is a resident in the Caucasus, but to the valleys of the Don and the Volga, and to the lakes and rivers of Western Siberia and Turkestan, it is a summer visitor, wintering on the Mekran coast and the west coast of India as far south as Ceylon.

On the western shores of the Pacific, breeding on the coasts of Kamtschatka and East Siberia, extending inland for perhaps a hundred miles in the valley of the Amoor, and on the coasts of Japan and North China, wintering on the coasts of South China, a very nearly allied species of Oyster-catcher is found, *H. osculans*, which has once occurred in Burma. It differs from the West Palæarctic species in having a longer bill, in having the upper tail-coverts more constantly tipped with black, and in having much less white on the primaries and secondaries, the white on the outside web of the former not appearing until the sixth quill, and on the inside web not until the second quill, instead of on the third and first respectively.

In Australia and New Zealand *H. longirostris* occurs, in which all the characters of the Pacific coast species are exaggerated, the primaries having no white on either web. On the Falkland Islands and the islands of the Straits of Magellan another species, *H. leucopus*, is found, which only differs in having pale flesh-coloured instead of red legs.

On the American continent, probably confined to the Atlantic coast of North and South America, a still more extreme form, *H. palliatus*, is found, in which not only is there no white on the primaries, but the rump also is black, the upper tail-coverts only being white spotted with black. It is not known that any of these four forms are connected by intermediate links, the geographical range of each being isolated, at least during the breeding-season *. Other more distantly allied species of Oyster-catchers occur having no white on any part of the plumage.

* Saunders, in the fourth edition of 'Yarrell's British Birds' (iii. p. 297), states that *H. longirostris* is found in Arrakan, China, and Japan, thus making its range inosculate with that of *H. osculans*. I can find no evidence of any kind in support of this statement, and believe it to be an error.

Messrs. Baird, Brewer, and Ridgway (Water Birds N. Amer. i. p. 111) place *H. longirostris* and *H. osculans* among the synonyms of *H. ostralegus*, stating that they are unable to discover any differences of plumage. It seems impossible that they can have passed by the great difference in the amount of white on the wings, and probably imagine it to be attributable to age; but this is certainly not the case.

The Oyster-catcher loves a rocky coast which is broken here and there by sandy bays and inlets, where the shingle is spread out into banks, and where creeks or lochs run some distance inland and are studded with rocks and islands. It is one of the wariest of birds, and never fails to rise whistling into the air at an intruder's approach, flying round and round his head, alighting perhaps a hundred yards away on the rocky beach eagerly scanning his movements. Sometimes, aided by the cover a rock-bound coast affords, the observer is able to approach the Oyster-catcher closely and watch its movements. It runs daintily up and down the sandy beach, its bright legs and bill contrasting with its pure black and white plumage, and every now and then it wades a little distance into the water. It may often be seen on the sands, when the tide is coming in, eagerly picking up small marine animals as they are washed ashore, allowing the spent waves and foam to flow all round it. Very often it may be observed searching the rocks for limpets, dexterously dislodging them by a twist of its powerful bill, or sometimes it may be seen, with head and neck drawn in between its shoulders, quietly dozing on a sea-girt rock. Oyster-catchers, if not exactly gregarious birds, are certainly very sociable ones, and even in the height of the breeding-season may be observed in little parties on the beach. The flight of this singular bird is very powerful, and performed by a series of rapid flappings, the wings being sometimes held motionless as the bird skims along, or elevated for a few moments after it alights. It sometimes runs for a little distance with its wings elevated. When alarmed the whole party rise *en masse*, and wheel round and round, all the time calling lustily to each other and arousing all the birds in the neighbourhood. Few things, indeed, add more to the charm of a wild rock-bound coast than the clear shrill whistle or pipe of the Sea-Pie or Oyster-catcher. Should one of the birds be shot, its companions seem to lose much of their habitual wariness in their anxiety for its fate, and flutter above the fallen bird, or sweep round it, crying mournfully. When wounded the Oyster-catcher often takes to the water; but, although it is capable of swimming, it does not seem at home on the waves. It is said occasionally to dive when hard pressed. It is difficult to convey a clear idea of the note of the Oyster-catcher by a written description. It is a sound somewhat intermediate between a pipe and a whistle, and may be expressed as *keep* or *kveep*, very loud and shrill. It is often rapidly repeated, and when several birds are calling at the same time the din they make is quite startling. This note is subject to some modulation, and is scarcely audible at times, when used as a call of affection between the sexes; and during the pairing-season it is often repeated so rapidly that it forms a trill.

The Oyster-catcher is very regular in its habits, and may be observed to pass with great punctuality to and from its feeding-grounds. As soon as the falling tide leaves the rocks bare the birds in little parties, or some-

times in large flocks, may be seen flying rapidly and silently just above the surface of the water on the way to their usual feeding-place, remaining there busily engaged amongst the seaweed-covered rocks after the tide turns, and until the rocks are gradually covered once more; then the Oyster-catchers quit them, remaining, however, as long as a mussel or a limpet is above water, and returning inshore to the quiet rocky points or sandy bays. If in a loch, they settle on the little islets, awaiting the falling of the tide, when they can renew their labours. Regularly as clockwork, in conjunction with the tide, the birds fly to and fro, and by observing this habit the state of the water may be pretty accurately judged. Oyster-catchers may often be seen flocking and feeding with other birds, but, being the first to take fright, they usually fly off by themselves.

The food of the Oyster-catcher is principally composed of mussels, whelks, limpets, and other mollusks, together with sand-worms, crustaceans, and other small marine animals. This fare is sometimes varied with the tender leaves and shoots of marine plants. The shell of the mollusk is never swallowed, the bird scooping out the animal with its sharp powerful bill, but quantities of grit and bits of pebble are sometimes found in its stomach. The Oyster-catcher will also feed on small fish. Its flesh, though dark, is by no means unpalatable.

The Oyster-catcher pairs in the beginning of April, and by the end of that month the birds seek a nesting-site, many eggs being laid early in May. In some districts they are not laid before the middle or end of this month or the beginning of June. The usual breeding-grounds of the Oyster-catcher are on the shingly beaches or on the rocky islands or stacks, and less frequently amongst the links or sand-dunes; for this bird is not particularly partial to sand, and even in most sandy districts always chooses a portion of the shore which is rocky or covered with shingle. The nest, if such it can be called, is generally just above high-water mark; but the eggs are often found in situations where they would be washed away if an exceptionally high tide occurred. On the rock-stacks the bird often hatches its eggs as much as fifty feet above the water, and its young, in some instances, are consequently prisoners until able to fly, if they do not swim or are not conveyed to the mainland by their parents. A peculiarity attached to the nidification of the Oyster-catcher is the number of nests it forms and then deserts ere making one to its liking. Frequently several empty nests are found near the one that is tenanted, as though the bird had tried several before it had been suited. The nest is merely a little hollow amongst the rough shingle and broken shells, or in the sand, about six inches across and about an inch deep, and this is lined with little scraps of shells and small pebbles, generally more or less neatly and smoothly arranged. Sometimes the eggs are deposited in a little hollow amongst the drifted seaweed. The eggs of this bird have been found in several

extraordinary situations, as, for instance, in a field and on the trunk of a felled pine-tree.

The eggs of the Oyster-catcher are three, and occasionally four, in number, sometimes only two, but three is the usual clutch. The ground-colour is pale buff, sometimes pale brownish buff, blotched, spotted, and streaked with dark brown and with underlying markings of grey. Some eggs are much more streaked than others; some are uniformly spotted over the entire surface, others have most of the markings in an irregular zone round the large end. They vary in length from 2·35 to 2·07 inch, and in breadth from 1·6 to 1·47 inch. Some eggs of the Oyster-catcher are indistinguishable from exceptionally dark eggs of the Stone-Curlew; but the latter are, on an average, smaller, and the markings are not so dark and decided: others somewhat resemble certain varieties of those of the Sandwich Tern. One brood only appears to be reared in the year; but should the first clutch of eggs be destroyed, others will be laid. The female performs the duties of incubation, and whilst this is in progress her mate is an ever-watchful sentinel, ready to give warning at the least approach of danger, when both birds rise screaming in the air, and fly wildly to and fro. The Oyster-catcher is a very conspicuous bird, and therefore leaves its eggs at the approach of danger to the safety which their protective colour secures for them. It is wonderful how closely the eggs resemble the surrounding pebbles and shingle. The old birds fly round and round uttering their shrill note, then perhaps alight on some distant rock, where they watch anxiously the doings of the intruder, ever ready to dart into the air again and renew their noisy clamour. As soon as the young are hatched they are led by their parents to the margin of the waves, where they soon learn to forage for themselves. At the least alarm the little creatures crouch close to the ground, the colour of their down being so protective in tint as to make their discovery very difficult.

As the season advances the Oyster-catchers become more gregarious, and the broods and their parents, together with the little parties that have kept close company through the summer, unite into flocks of greater or less extent, and throughout the winter roam the coasts in search of food, often wandering far from their usual summer haunts. Numbers of Oyster-catchers from North Europe also arrive on our shores in autumn to spend the winter, and are repeatedly taken on migration in the flight-nets on the Lincolnshire coast.

All the upper parts of the Oyster-catcher are black, with the exception of the rump and upper tail-coverts, the basal half to two thirds of the tail-feathers, and a broad band across the wing, formed by the greater wing-coverts and some of the secondaries, which are white. The primaries are also more or less marked with white. The underparts are white, with the exception of the chin, throat, and breast, and a few of the

outermost wing-coverts, which are black. Bill and orbits orange-vermilion; legs and feet pinkish red, claws nearly black; irides crimson. The female does not differ from the male in colour. In winter a narrow white band extends from the chin meeting a broad white band, extending from the tips of the ear-coverts across the throat, and the white spot under the eye becomes larger. In birds of the year the black is suffused with brown, and the white patch on the throat is larger; whilst in young in first plumage the greater wing-coverts, innermost secondaries, and scapulars have pale buff margins, the longest upper tail-coverts are barred with buff and black at the tip, and, as in adult summer plumage, there is no white on the throat*. The general colour of the upper parts and throat of the young in down is grey, with blackish marks on the head and back, the underparts below the throat being white.

* Curiously enough the young in first plumage of the East Palæarctic species, *H. osculans*, has the inside web of the primaries marked with white, as in the adult of the West Palæarctic species, but the white on the outside web is the same as in that of the adult of the East Palæarctic species. It is a remarkable fact that Dresser should have omitted to describe the young in first plumage of so common a bird as the Oyster-catcher; he probably thought that it was similar to what he vaguely calls young in autumn dress, his description of which is that of a bird of the year.

Genus CHARADRIUS.

The genus *Charadrius* was recognized by Linnæus in 1766, in the 12th edition of his 'Systema Naturæ,' i. p. 253. The Golden Plover (*Charadrius pluvialis*) may be accepted as the type, on the ground that Brisson regarded it as so emphatically the typical Plover that he changed the name of the genus from *Charadrius* to *Pluvialis*.

The true Plovers may be distinguished from all the other genera in this family, except the Lapwings, by the peculiar shape of the bill, which gradually tapers from the base for about two thirds of its length, but swells again towards the tip*. From the Lapwings they may be distinguished by their pointed wings; the first primary is the longest, and each succeeding one is considerably shorter, so that the fourth primary falls short of the first by a distance about equal to the length of the bill. The hind toe is generally absent, but in some species it is present. In some species the tarsus is reticulated, and in others it is scutellated in front and occasionally behind.

This genus is cosmopolitan, and contains about forty species. Eight of these are European, of which seven are included in the list of British birds, but it is difficult to define with accuracy the limits of this genus.

It has been taken for granted by some ornithologists that if we had all the forms of bird-life which exist, or have existed, before us, they would be found to intergrade with each other in every direction, and that consequently no classification of them would be possible. This is an utter fallacy. If the hypothesis of evolution be true, no doubt a complete series must exist or have existed between any two or more forms, but that consequently no classification of them would be possible is not true, or is at least in the highest degree improbable. Because the boundaries between groups cannot be defined with accuracy, it does not follow that characteristic groups do not exist and would not be well marked. To make such an assumption is as absurd as to say that the Himalayas cannot be distinguished from the steppes of Asia, because they intergrade with each other,

* The Turnstones are slightly aberrant in this respect, having the profile of the upper mandible of the short thick bill nearly straight; they are a very perplexing group of birds to the systematic ornithologist, and form an intermediate link between the Plovers and the Short-legged Sandpipers. To the former they are connected by a Pacific island bird (*Charadrius virgatus*), which is to all intents and purposes a Turnstone, with the bill of a Plover. According to Nitzsch the internal structure of the Turnstones more closely resembles that of the Plovers than that of the Sandpipers, so that, on the whole, they may be regarded as slightly aberrant Plovers, under the subgeneric name of *Morinella*.

and the boundary-line where the one begins and the other ends cannot be drawn to a nicety. Nature has drawn very few lines, but she is fond of producing very characteristic masses, which the intelligent eye can easily see and broadly define. It is only the pedant who ignores the difference between mountain and valley, because, forsooth, he cannot say to an inch where one begins and the other ends.

The Plovers inhabit almost all kinds of scenery, from the bare mountain-tops to the richly cultivated lands, the open moors and commons, and the sea-shore. During the breeding-season they are more or less sociable, and in winter often congregate in large flocks. They run and walk with ease, and their flight is powerful, moderately quick, and well sustained. Their usual note is a loud and shrill whistle, often considerably modulated, during the pairing-season, into a not unmusical trill, uttered as the bird takes a short flight in the air, almost after the manner of the Pipits. Their food consists of insects, worms, mollusks, small marine animals, &c. Some species make a slight nest in a depression in the ground, others deposit their eggs in a hollow in the sand or on shingle; and their eggs, generally four in number, are very pyriform, buff of different shades, spotted, blotched, and streaked with brownish black and with grey underlying markings.

CHARADRIUS INTERPRES.

TURNSTONE.

(Plate 24.)

Arenaria arenaria, *Briss. Orn.* v. p. 132 (1760, adult).
Arenaria cinerea, *Briss. Orn.* v. p. 137 (1760, immature).
Tringa interpres, *Linn. Syst. Nat.* i. p. 248 (1766, adult); **et auctorum plurimorum**—*Gmelin, Latham, (Temminck), (Naumann), (Saunders)*, &c.
Tringa morinella, *Linn. Syst. Nat.* i. p. 249 (1766, immature).
Tringa hudsonica, *Müll. Natursyst. Suppl.* p. 114 (1776).
Morinella collaris, *Meyer, Taschenb.* ii. p. 383 (1810).
Strepsilas interpres (*Linn.*), *Illiger, Prodr.* p. 263 (1811).
Strepsilas collaris (*Meyer*), *Temm. Man. d'Orn.* p. 349 (1815).
Arenaria interpres (*Linn.*), *Vieill. N. Dict. d'Hist. Nat.* xxxiv. p. 345 (1819).
Tringa oahuensis, *Bloxham, Byron's Voyage of the 'Blonde,' App.* p. 251 (1826).
Charadrius cinclus, *Pall. Zoogr. Rosso-Asiat.* ii. p. 148 (1826).
Cinclus morinellus (*Linn.*), *Gray, List Gen. B.* p. 85 (1841).
Cinclus interpres (*Linn.*), *Gray, Gen. B.* iii. p. 549 (1846).

The Turnstone must be regarded as a visitor to the British Islands on spring and autumn migration, but a few remain during winter. It is more numerous in Scotland and Ireland than in England, and in the former country it may possibly breed. When we bear in mind how little is known of the ornithology of the islands on the wild west and north of Scotland, and remember that it breeds at no great distance from Copenhagen, it is difficult to believe that the Turnstone does not breed on the Hebrides in limited numbers. It has been said to breed in the Channel Islands, but no direct evidence to prove this has been obtained.

The Turnstone is exclusively a shore-bird, except that it crosses the great continents on spring and autumn migration to and from its winter-quarters. It has not been known to breed south of the Baltic; but my friend Mr. Ramsay informs me that it is resident on the shores of Lord Howe's Island, whence he has received examples of young with their quills not grown and with down mixed with the feathers. Its breeding-range is supposed to extend as far north as land exists, and during winter there is probably no part of the coasts south of the Arctic circle in either hemisphere on which it is not occasionally seen during winter. In California and the adjoining coasts there is a resident species, *C. melanocephalus*, which differs from the Common Turnstone in having those parts of the plumage which are chestnut replaced by black, and in having no white on the head or neck.

The Turnstone lives almost exclusively on the coast, preferring those that are bold and rocky; nevertheless it is often found on low sandy shores, or mud-flats, and at the mouths of large rivers. It seldom goes far from water, living on the beach, picking up its food amongst the débris on the shore, or turning over the pebbles and shells that lie scattered about on the sands. In this country it is frequently observed in little parties, or perhaps more frequently in pairs, which sometimes associate with other wading birds. It is a very active little creature, running incessantly about the sand and rocks, tripping over the masses of stranded seaweed, and peering into all the little nooks and crevices in eager search for food. Sometimes it runs a few feet with great rapidity, then pauses motionless for a moment, as if listening intently, then darts off again either to the right or left. It is not a very shy bird, but is rather wary, and generally takes wing if it is approached very closely. Its flight is rapid, and it seldom rises more than a few feet from the ground, the wings being beaten rapidly, then held motionless for a short time while it skims along a little way and then flaps its wings again. The Turnstone does not entirely confine itself to running about the shore or flying from place to place, for it was observed by Mr. Hume to swim with ease, sitting gracefully on the water outside the foaming breakers, ever and anon rising and flying a little way, then again settling on the waves. It is also fond of alighting on an elevated place; and Swinhoe observed it in China sitting on the fishing-stakes, and ranged in rows on the ropes that were spread between them. The Turnstone possesses the peculiar habit of turning over small pebbles, shells, or any other objects lying on the beach, to search for the various small marine animals that lurk beneath them. From this singular trait its bill has probably become modified into its aberrant form. Edwards, the "Scotch naturalist," relates some very interesting particulars concerning the actions of three Turnstones which he observed on the Banffshire coast. They tried for a long time to overturn a stranded fish, and eventually accomplished the task by undermining it on one side, and then regaled themselves on the food that was lurking underneath. Audubon noticed that the birds often used their breasts as well as their bills in turning over an unusually large object.

The food of the Turnstone is principally composed of small crustaceans, sand-worms, and little shells. To this fare is doubtless added many other small marine animals which the bird incessantly meets with in its search amongst the shingle and débris of the shore.

The call-note of the Turnstone is a clear loud shrill whistle, bearing some resemblance to the call-notes of the Golden and Grey Plovers, which may be represented by the syllable *kü* or *keet*. It has also a double note, which may be represented by the syllables *kitter*, and not unfrequently the

single note is added, making a treble note, *kitter-keet*. In spring, during the pairing-season, it is said that these notes are often so rapidly repeated that they form a trill.

The spring migration of the Turnstone commences in our islands late in April, and but few remain until the end of May; its breeding-season begins in June, a little later in the high north than in the south. This bird was first observed in the winter-quarters of the 'Alert' in Grinnell Land, in lat. 82½°, on the 5th of June, and by the 12th of August the young broods were able to fly. It often selects a nesting-site on a small island or well-secluded part of the rocky coast, where tufts of grass and small bushes are scattered about; and several pairs of birds often make their nests near each other. The nest is very slight, composed of a few bits of dry herbage or withered leaves, scratched into a little hollow, which is usually selected under the shelter of a tuft of herbage, or under a broad-leaved plant, or behind a bush. The eggs are four in number, differing considerably from those of the typical Plovers, and approaching much more closely those of the Sandpipers. They vary from pale olive-green of different shades to pale buff in ground-colour, dashed, clouded, spotted, and blotched with olive-brown and very dark brown, and with underlying markings of purplish grey. Some specimens are boldly streaked with dark brown, especially on the larger end, others have most of the larger markings running in an oblique direction round the surface. Some are much more richly marked than others; occasionally the markings are blurred and indistinct, whilst on others they are bold and well defined. They vary in length from 1·7 to 1·52 inch, and in breadth from 1·2 to 1·1 inch. The eggs of the Turnstone cannot be confused with those of any British Plover, nor easily with those of any of the Sandpipers. Perhaps they most resemble certain varieties of the Common Snipe, though they are seen to be very different when compared. Only one brood is reared in the year; and both male and female appear to take turns in the work of incubation.

When its breeding-grounds are invaded, the Turnstone becomes very anxious, settling on the masses of rocks and running about in a very restless manner, every now and then uttering a shrill tremulous note. The bird does not, however, appear to try and lure any one from its nest by feigning lameness. As soon as the young are hatched the parents lead them to the shore, where they are soon able to forage for themselves. As soon as they are fledged, or shortly after, they retire southwards to their winter-quarters, travelling thousands of miles, sometimes across country, but often down the coast-line or across the intervening seas. During the whole winter they keep to the shore, either in flocks or in scattered pairs. A few young birds make their appearance on our own coasts by the end of July, but the main flocks do not arrive until August. The low-lying

eastern coasts are not so suited to their habits as the rocky shores where the birds congregate for the winter.

The Turnstone is a very gaily coloured bird, its plumage showing strong contrasts of black, white, chestnut, and brown. In the adult male in summer the lower throat and upper breast are black, extending downwards on each side of the lower breast and upwards in a broad band on each side of the neck, which nearly meets at the nape and branches off in one direction through the cheeks to the base of the bill, and in another across the ear-coverts and through the eye, meeting on the forehead. The crown is striped with black, and the sides of the mantle and the outer scapulars are black. The rump, quills, the central portion of the tail, and the lesser and median wing-coverts are brown. The chestnut is most brilliant on the centre of the upper back and on the inner scapulars, and is more or less prominent on the lower wing-coverts and lower scapulars. This distribution of the colours leaves the forehead, lores, eye-stripe, nape, hind neck, lower back, upper tail-coverts, chin and upper throat, centre of the breast, axillaries, under wing-coverts, and the whole of the underparts below the breast white. Bill black; legs and feet orange-red, claws dark brown; irides hazel. The female only differs from the male in having the black portions of the plumage duller in colour, the white on the head and neck somewhat suffused with brown, and the chestnut less brilliant. After the autumn moult the winter plumage is assumed, in which the chestnut and the black feathers are replaced by dark-brown feathers with pale edges, which is also the colour of the crown, nape, and hind neck, the rest of the plumage being nearly the same as that of summer. Birds of the year differ from adults in having the white on the back of the neck suffused with chestnut, and in having the lesser and median wing-coverts chestnut with brown centres. Young in first plumage closely resemble adults in winter, but the general colour is a paler brown, and the entire head, except the chin and throat, is almost uniform brown. Young in down have the upper parts dark grey marked with black, and the underparts shading from grey on the throat to white on the belly.

CHARADRIUS MINOR.

LITTLE RINGED PLOVER.

(Plate 26.)

Charadrius dubius, *Scop. Del. Flor. et Faun. Insubr.* p. 93 (1786, *ex Sonnerat*).
Charadrius erythropus, *Gmel. Syst. Nat.* i. p. 684 (1788, *ex Sonnerat*).
Charadrius curonicus, *Gmel. Syst. Nat.* i. p. 692 (1788, *ex Beseke*).
Charadrius philippinus, *Lath. Ind. Orn.* ii. p. 745 (1790, *ex Sonnerat*).
Charadrius minor, *Wolf & Meyer, Vög. Deutschl.* i. p. 182 (1805); **et auctorum plurimorum**—*Temminck, Naumann, (Bonaparte), Lichtenstein, (Reichenbach), (Brehm), (Nordmann), (Krüper), (Homeyer), (Severtzow), (Durnford), (Rüppell), (Brooke), (Harting), (Saunders), Macgillivray, Gould, Nilsson, Dawson Rowley, Lilford, Wright, (Salvin), (Tristram), (Giglioli), (Swinhoe), (Shelley)*, &c.
Charadrius fluviatilis, *Bechst. Naturg. Deutschl.* iv. p. 422 (1809).
Charadrius pusillus, *Horsf. Trans. Linn. Soc.* xiii. p. 187 (1822).
Ægialitis minor (*Wolf & Meyer*), *Boie, Isis*, 1822, p. 558.
Charadrius minutus, *Pall. Zoogr. Rosso-Asiat.* ii. p. 144 (1826).
Charadrius hiaticuloides, *Frankl. Proc. Zool. Soc.* 1831, p. 125.
Charadrius intermedius, *Ménétr. Cat. Rais. Cauc.* p. 53 (1832).
Charadrius zonatus, *Swains. B. of W. Afr.* ii. p. 235, pl. 25 (1837).
Ægialitis curonicus (*Gmel.*), *Keys. u. Blas. Wirb. Eur.* p. lxxi (1840).
Hiaticula philippina (*Lath.*), Hiaticula pusilla (*Horsf.*), } *Blyth, Cat. B. Mus. As. Soc.* pp. 263, 264 (1849).
Hiaticula curonica (*Gmel.*), ? Hiaticula simplex, } *Licht. Nomencl. Av.* p. 94 (1854).
Ægialites zonatus (*Swains.*), *Hartl. Orn. W.-Afr.* p. 216 (1857).
Ægialites pusillus (*Horsf.*), *Swinhoe, Ibis*, 1860, p. 63.
Ægialites philippinus (*Lath.*), *Swinhoe, Ibis*, 1861, p. 342.
Ægialitis minutus (*Pall.*), *Jerdon, B. India*, ii. p. 641 (1864).
Pluvialis fluviatilis (*Bechst.*), *Droste, Vog. Borkum*, p. 153 (1869).
Ægialitis microrhynchus, *Ridgw. Am. Nat.* viii. p. 109 (1874).

The Little Ringed Plover is a very rare straggler to England, and has not hitherto been detected in Scotland or Ireland. Many of the reported instances of its capture in this country are based on erroneous identification, the small form of the Ringed Plover, in most cases, having been mistaken for the rarer bird. It is difficult to give the exact number of Little Ringed Plovers that have been obtained in England, but probably they do not exceed half a dozen. The first example appears to have been obtained at Shoreham, in Sussex, by Mr. Henry Doubleday, who lent the specimen to Mr. Gould, by whom it was recorded in his 'Birds of Europe.' Another example was shot at Trescoe, in the Scilly Islands, on the 23rd of October, 1863 (Rodd, Zoologist, 1863, p. 8847). A third was shot by Mr. Harting, at Kingsbury Reservoir, in Middlesex, on the 30th of August, 1864 (Harting, Zoologist, 1864, p. 9283). A fourth is in Mr. Borrer's collection, which was shot in May at Chichester Harbour, but the exact

date appears to be unknown. Other examples are said to have been obtained in Norfolk, near Shoreham in Sussex, and at Kingsbury Reservoir, but the evidence respecting them is not very satisfactory.

The Little Ringed Plover is a summer visitor to the whole of Europe north of the basin of the Mediterranean and south of about lat. 60°, between which and the Arctic circle it can only be regarded as an accidental straggler. It is a resident in the basin of the Mediterranean. South of the Great Desert it is only known as a winter visitor, extending on the west coast of Africa as far south as the equator; but on the east coast its winter range appears to be much greater, extending to Mozambique and the Mauritius. On the Asiatic continent it is a summer visitor throughout the Palæarctic Region, as far north as lat. 60°, and a winter visitor throughout the greater part of the Oriental Region.

The Little Ringed Plover is very nearly allied to the Common Ringed Plover, which is distinguished from it by its larger size and by having white shafts to all the quills.

A race of the Little Ringed Plover, *C. jerdoni*, is said to be a resident in Ceylon, and also occasionally to stray to the Indian peninsula. It is stated to be smaller than its migratory ally, to have a yellower bill, and to be furnished with corrugations on the orbital circle.

A giant form of the Little Ringed Plover, *C. placidus* (attaining a length of wing of five and a half inches), is found in Nepal, and probably ranges through the eastern Himalayas into the valley of the Yang-tse, whence it extends to all the islands of Japan. The Little Ringed Plover has no ally on the American continent nearer than *C. semipalmatus*, a species intermediate in size between the Common and Little Ringed Plovers of Europe, but more nearly allied to the former, as there is a considerable amount of white on many of the shafts and some of the inner webs of the quills. The alleged occurrence of the Little Ringed Plover on the American continent in California and Alaska rests upon unsatisfactory evidence.

The Little Ringed Plover prefers the banks of rivers and inland sheets of water to the sea-shore. On the latter it seems to be rarely met with. It delights in the sandy beds of rivers, especially those which are shallow and contain many sand-banks and dry pebbly stretches, where it can find its food and rear its young. I found it not uncommon on the banks of a half-dried-up river in Asia Minor, between Smyrna and the site of the ancient Sardis. It is found far inland, and occasionally frequents fallows and sandy plains at a considerable distance from water. In its habits it very closely resembles its congener the Ringed Plover. Like that species it is usually seen running hither and thither on the sands, close to the edge of the water, now and then taking short flights just above the ground or standing motionless for a few moments. It is rather more shy than its larger ally and takes wing more readily. In its flight it is very similar

to the Ringed Plover, but its notes are very different from that of either of its near allies.

Its ordinary call-note is a loud, clear, plaintive, and monotonous *pee*, almost lengthened into two syllables. When alarmed the note is pronounced much shorter and repeated more rapidly; and in spring it is uttered still more rapidly, so as to become continuous, especially at the close of its love-song, when it becomes a trill.

The Little Ringed Plover is perhaps most active in the pairing-season. When Dixon was in Algeria in the spring of 1882 he noticed that the male often soared into the air like a Lark, and flew about for some considerable time, uttering his peculiar love-song, soaring higher and higher above the sandy wastes, then gradually descending again. The food of the Little Ringed Plover is composed of insects of various kinds, worms, beetles, grubs, &c., and its stomach usually contains a little gravel or sand. It arrives at its northern breeding-grounds in April, in very early seasons late in March, leaving for the south in August and September. Its eggs are seldom laid before May, often not until June. It makes very slight provision for them, merely scratching a little hollow in the sand or shingle, which it treads into a very neat, round, shallow basin, in which the eggs are laid without any lining. They are four in number, pyriform in shape, pale buff in ground-colour, speckled and streaked with surface-spots of dark and light brown, and with underlying markings of inky grey. The spots are pretty evenly distributed over the surface, but are usually most numerous on the large end. The eggs vary in length from 1·2 to 1·15 inch, and in breadth from ·9 to ·85 inch. In the streaky nature of their markings the eggs of this bird show an affinity with those of the Kentish Plover, but their lighter colour, more delicate markings, and smaller size readily distinguish them. The eggs are extremely difficult to find, owing to their resembling in colour the surrounding objects. The bird does not sit very close—in fact, during the day, if the weather be warm and fine, it does not sit on its eggs much, the sun supplying them with sufficient warmth. When the young are hatched the old birds often become very anxious for their safety, and will try to allure an intruder away, or hover above his head, uttering their note incessantly until he takes his departure.

The Little Ringed Plover does not appear to be so gregarious or sociable a species as the Ringed Plover, and even in winter does not gather into such large companies. Legge says that in Ceylon, where this bird winters in some numbers, it is generally seen alone, with one or two companions not far distant, and that he has never seen more than half a dozen in the same locality, where it sometimes keeps company with Sand-Plovers and associates with the Kentish Plover.

The Little Ringed Plover is almost an exact miniature of the Ringed

Plover, but differs from it in the following important particulars:—the white on the primaries is confined to the shaft of the first primary; the yellow on the bill is confined to the base of the lower mandible, and the legs and feet are dull yellow instead of orange-yellow; orbits yellow, irides dark hazel. The changes of plumage dependent upon age, sex, and season resemble those of the Ringed Plover. Young in down somewhat resemble those of the Ringed Plover, but the ground-colour of the upper parts is more buff and the dark markings not so pronounced.

KNOTS.

CHARADRIUS HIATICULA AND CHARADRIUS MAJOR.

RINGED PLOVER and GREATER RINGED PLOVER.

(PLATE 26.)

It is impossible to ignore the fact that there are two races of the Ringed Plover. A small dark race, with somewhat slender legs and feet, with a length of wing varying from 4·8 to 5·2 inch, is a migratory bird and very widely distributed; whilst a larger paler race, with stouter legs and feet, and with a length of wing varying from 5·0 to 5·5 inch, appears to be a resident in the British Islands and on the adjoining coasts. Many writers have remarked that these two races, like the large and small races of the Dunlin, migrate in separate flocks and have different areas of distribution. So far as I have been able to ascertain, the Ringed Plovers breeding in the British Islands and Western Europe lay larger eggs than those breeding elsewhere. The small dark race arrives on our shores late in spring and does not remain here to breed, but soon passes northwards on migration to its breeding-grounds in Arctic Europe. The two races can only be subspecifically distinct, as they not only intergrade in colour, but large examples of the eastern exceed in length of wing small examples of the western race. The synonymy of the two forms is as follows :—

CHARADRIUS HIATICULA.

RINGED PLOVER.

Pluvialis torquata minor, *Briss. Orn.* v. p. 63, pl. v. fig. 2 (1760).
Charadrius hiaticula, *Linn. Syst. Nat.* i. p. 253 (1766); **et auctorum plurimorum**—*Naumann, Schlegel, Temminck, (Dresser), (Saunders)*, &c.
Ægialitis hiaticula (*Linn.*), *Boie, Isis*, 1822, p. 558.
Hiaticula annulata, *Gray, List Gen. B.* p. 65 (1840).
Hiaticula hiaticula (*Linn.*), Hiaticula arabs, *Licht. Nomencl. Av.* p. 94 (1854).
Ægialites auritus, *Heugl. Syst. Uebers.* p. 56 (1856).

CHARADRIUS HIATICULA MAJOR.

GREATER RINGED PLOVER.

Pluvialis torquata, *Briss. Orn.* v. p. 60, pl. v. fig. 1 (1760).
Charadrius torquatus (*Briss.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 28 (1816, *nec Linn.*).
Hiaticula torquata (*Briss.*), *Gray, List Sp. Birds in Brit. Mus.* iii. p. 68 (1844, *nec Linn.*).
Charadrius major, *Tristram, fide Gray, Hand-l. B.* ii. p. 15 (1870).

The Ringed Plover is very generally distributed in all suitable localities throughout the British Islands, most common on the sandy coasts, but occurring in considerable numbers in favourable inland districts, as on the banks of large rivers and the shores of lochs. It is found on most of the adjoining islands, including the Orkneys and Shetlands, the Outer Hebrides, and the Channel Islands.

The geographical distribution of the Ringed Plover differs very widely from that of its two British allies. It breeds much further north and winters further south, and may be regarded as a Western Palæartic species which has only recently emigrated into Asia. It breeds in Greenland, Iceland, Spitzbergen, and Nova Zembla. It is a regular summer visitor to the whole of Europe north of the Alps, and to Asia at least as far east as the Taimyr peninsula, and possibly as far as Behring's Straits*. In South Siberia it is not known to have occurred east of Lake Baikal; but it breeds regularly in Western Siberia and sparingly in Turkestan. It probably passes through Persia on migration, and winters in the basin of the Mediterranean and Africa, where it has been found in almost every part of the continent. It has occurred as an accidental straggler in North-west America, India, and Australia. Heuglin suggests that some remain on the shores of the Red Sea to breed, but the evidence is not at all conclusive. The Ringed Plover has no representative in India nor China; but throughout North America it is replaced by *C. semipalmatus*, a smaller bird, without the white eye-stripe, and having the web connecting the middle and outer toes at the base slightly more developed than in our bird, but with the same white shaft-streaks on the wing, which it is very difficult to believe are not a much older character than the structure of the feet, and serve to distinguish this species and its allies from the Little Ringed Plover and its allies.

The large race of Ringed Plover is a resident in the British Islands, as it probably is in the other portions of its range. It is not known that the small race is anywhere a resident; it is said to leave its winter-quarters in Africa in April and May, and to pass along our coasts from the first week of May to the first week of June. The return migration commences in the end of August and continues until the end of October.

The haunts of this bird are the sandy shores of rivers and lakes, and especially of the sea. It loves to frequent the mouths of rivers, where large banks of sand and mud are left exposed at low tide; and quiet bays and long reaches of sandy shore strewn here and there with shingle and broken shells are places it delights in. Sometimes it may be met with on sandy warrens some distance from any water; and it may frequently be seen amongst the dunes a mile or more from the edge of the sea, and it

* It is possible that the example obtained by the 'Vega' expedition may have been a specimen of *Charadius placidus*.

is very common on the mud-flats which are the favourite resort of various species of Sandpiper.

The Ringed Plover is a wild wary bird when feeding, especially in its winter-quarters, or where it has been much molested; but at its breeding-grounds it changes its character and becomes an unobstrusive little creature, by no means shy or wary, allowing you to walk within a few yards of it without betraying any signs of fear. As you approach, it often runs a little distance, then may pause to watch you with just a trace of anxiety; or more probably it flies smoothly along just above the sands, uttering a plaintive note as it goes, and alights on a little eminence to watch your movements. Few shore-birds are more engaging in their actions than the Ringed Plover. It is a pretty sight to watch half a dozen of these little creatures tripping over the sands or running amongst the pebbles and other shore débris searching for food. They run with great swiftness, every now and then pausing a moment, then darting on a few feet, then resting again, putting the observer irresistibly in mind of the progress of a fly on a window-pane. They keep close to the edge of the water, following the receding waves to pick up their meal, often wading through little pools, ever being driven backwards by the approaching waves, and as constantly following them as they recede, to glean the rich harvest of marine animals left by the receding tide. If the shore is sandy the birds are easily discernible for a considerable distance; but when it is strewn with pebbles and shingle it is hard to discover their whereabouts, and very often they keep rising almost at the intruder's feet, squatting close until almost trodden upon ere they take wing. The flight of this little bird is performed by regular and quick beatings of the wings, and every now and then it glides for a short distance, especially when going to alight. They usually fly quite close to the ground, sometimes not more than a few inches above it, but at other times they may be seen to soar high in the air and fly round and round; they often do this if shot at or otherwise alarmed. When in flocks they sometimes perform various graceful evolutions in the air, wheeling round, simultaneously turning or swooping close to the ground and rising again as if all were moved by one common impulse. When engaged in searching for food the Ringed Plovers occasionally mix with other shore-birds, such as Dunlins or other Sandpipers; but when disturbed they generally keep to themselves, flying away in a compact flock like Starlings. If little of the shore is exposed at high water the birds repair to more elevated ground, and there await the ebbing of the tide.

The food of the Ringed Plover is composed largely of sea-worms and small marine animals, such as shrimps, sand-lice, &c. It also catches great numbers of insects as they flit past or alight on the sand, and it searches for beetles. A little coarse sand or a few small pebbles are swallowed to aid in the digestion of its food. The call-note of the Ringed Plover

is a somewhat harsh *trr*; but its alarm-note is a very noisy though plaintive *too-it*. In the pairing-season the call-note is repeated so rapidly that it forms a trill, and becomes also more liquid in tone.

In this country the breeding-season of the Ringed Plover commences in April. Early in that month the large flocks, which have collected and lived in company during the winter, disperse into smaller parties and spread themselves over their breeding-grounds. At all times of the year this bird is more or less sociable. Numbers breed in some districts very close together; and during the summer they may always be seen in companies of half a dozen or more, according to their abundance in the neighbourhood. The greater number of birds remain on the sandy shores to rear their young; but others have favourite nesting-places on the shining strands of inland lochs and rivers, whither they repair in spring. Sometimes the nest is made at a considerable distance from water. The Ringed Plover makes little or no nest. It contents itself by scratching a little hollow in the sand, less frequently in shingle, or even takes advantage of a hole already formed, but occasionally it deposits its eggs on the bare flat sand. The eggs are laid from the middle of April to the end of May; but they have been found as early as the last week in March and as late as the beginning of August. Mr. Maurice C. H. Bird has written to inform me that he has known young birds only a few days old on Winterton Beach on the 3rd of August. The earliest eggs are laid, as a rule, in the south of England, but in the north they are a little later. The nests are generally not far from high-water mark, and are extremely difficult to find. The moment danger threatens, the parents leave their eggs, relying for their safety on their protective colour, which scarcely differs from that of the sand on which they are placed. To the experienced ornithologist the anxious cries of the parents often betray the vicinity of the nest, which may be found after a long and patient search.

The eggs are four in number, and do not vary much in colour. They are very pale buff or stone-colour, spotted with blackish brown and with underlying markings of inky grey. The spots are pretty evenly distributed over the surface, but on many specimens are most numerous on the large end, and vary in size from specks to that of a very small pea, the average being about that of No. 10 shot. The eggs are pyriform in shape, and vary in length from 1·55 to 1·3 inch, and in breadth from 1·05 to ·98 inch, the larger dimensions being those of British examples. The eggs of the Ringed Plover are not easily confused with those of any other British species, being larger and paler than either those of the Little Ringed Plover or the Kentish Plover. If the first eggs are removed others will be laid, sometimes in the same nest; but there appears to be no satisfactory evidence that the bird rears more than one brood in the year. When the nest is menaced by danger the old birds

are sometimes very demonstrative, especially if they have young; and they will feign lameness to lure an intruder away from their treasure. When alarmed, the young birds try to elude discovery by crouching close amongst the pebbles. At this season the old birds are surprisingly tame and confiding, seeming to lose all sense of personal danger in their anxiety for their helpless broods. Other enemies besides man have to be guarded against. My friend Mr. C. Holdsworth has sent me an interesting account of the Hen-Harrier preying upon the eggs of the Ringed Plover; he watched a bird of that species destroy several nests after systematically hunting for them on the sands. By watching carefully the actions of the Harrier he was able to find the eggs of the Plover with little difficulty.

The adult male Ringed Plover in breeding-plumage is a conspicuously marked bird, possessing only three colours in its plumage, viz. black, white, and greyish brown. The black portion is confined to a narrow band at the back of the neck, which becomes broad on the lower throat and upper breast; a narrow black band at the base of the upper mandible extends through the lores and below the eye to the ear-coverts, joining a band across the fore part of the head in front of the eye. The white parts of the plumage comprise the entire underparts below the upper breast, including the axillaries and under wing-coverts, a narrow ring round the neck, which widens so as to extend over the cheeks, chin, and upper throat, a white patch on the forehead between the black on the fore part of the crown and that at the base of the bill, and an indistinct eye-stripe behind the eye. The hind head and nape, and the remainder of the upper parts below the black ring round the neck, are greyish brown, darkest on the quills and two central tail-feathers. The outside tail-feather on each side is white, and the remainder, except the two central ones, have broad white tips emphasized by broad dark subterminal bands. A white bar across the wing is formed by the tips of the greater wing-coverts and some of the secondaries; the middle portion of the shafts of the quills is also white, extending to the outer webs after the third or fourth primary. Bill—basal half orange-yellow, terminal half black; legs and feet orange-yellow, claws black; orbits orange; irides hazel. The female is not quite so brilliant in colour as the male. After the autumn moult very little change is perceptible, except that the male is scarcely more brilliant in colour than the female. In birds of the year the portions which are black in the adult are dark brown: in young in first plumage these feathers are almost uniform in colour with those of the back, and, like them, have narrow pale tips emphasized by a narrow subterminal dark brown bar; the bill is also uniform black. The young in down have the upper parts greyish brown, mottled with dark brown, the underparts pure white, and have traces of a black and white collar round the neck.

CHARADRIUS CANTIANUS.

KENTISH PLOVER.

(Plate 26.)

Charadrius cantianus, *Lath. Ind. Orn. Suppl.* p. lxvi (1801); **et auctorum plurimorum**—*Gould, Jerdon, (Bonaparte), (Blyth), (Dresser), (Saunders),* &c.
Charadrius albifrons, *Wolf & Meyer, Vög. Deutschl.* i. p. 180 (1805).
Charadrius littoralis, *Bechst. Naturg. Deutschl.* iv. p. 430 (1809).
Ægialitis cantianus (*Lath.*), *Boie, Isis,* 1822, p. 558.
Hiaticula elegans, Hiaticula cantiana (*Lath.*), *Licht. Nomencl. Av.* p. 94 (1854).
Ægialophilus cantianus (*Lath.*), *Gould, Handb. B. Austr.* ii. p. 234 (1865).

The Kentish Plover was discovered near the end of the last century by Mr. Boys, of Sandwich, who sent an example to Latham in 1787, which was figured by Lewin in his 'Birds of Great Britain' (vi. p. 44, pl. 186), published in 1800. In 1791 Mr. Boys sent two other examples to Latham, who described it under the name of *Charadrius cantianus* in the Supplement to his 'Index Ornithologicus,' published in 1801. It is one of the most local of British birds, and has only occurred very sparingly on the south and east coasts of England, as far north as Flamborough Head in Yorkshire, and as far west as Cornwall. Its only breeding-places in this country appear to be on the coasts of Kent and Sussex; but even there it is a rare bird, and is fast disappearing before the inroads of collectors. It does not appear ever to have been observed in Scotland; and in Ireland it is only known as a rare straggler. In the Channel Islands it is much commoner, and breeds there in considerable numbers.

So far as is known, the Kentish Plover only breeds on the margins of salt-lakes or on the sea-shore; nevertheless its breeding-range extends from the Atlantic to the Pacific. It is a regular summer visitor to the coasts of South Sweden, Denmark, Holland, Belgium, and France. It is a resident on the coasts of Spain, Portugal, the Azores, Canaries, Madeira, and on both shores of the Mediterranean. To the salt-marshes on the steppes of Southern Russia, the shores of the Caspian, the margins of the salt-lakes of Turkestan, South Dauria, and Mongolia it is a summer visitor. The Kentish Plovers which breed in the northernmost portion of their range in Europe appear to winter on the coasts of Africa, where they have been met with as far south as the Cape Colony. The Asiatic birds winter on the Mekran coast, in India, Ceylon, Burma, the Malay peninsula, China, and Japan.

The Kentish Plover has two very near allies: one of these (*C. peronii*) is a resident in Formosa and the coast of South China; it differs from

our bird in having a longer and stouter bill and pale legs. The other allied species (*C. nivosus*) is found in California and on the coasts of South America, and has the small bill of *C. cantianus* with the pale legs of *C. peronii*. It is very doubtful whether either of these birds are more than subspecifically distinct from the Kentish Plover.

The Kentish Plover is a summer visitor to England, generally arriving about the end of April or early in May, leaving for the south again in August or the beginning of September. A straggler is now and then seen even in winter, leading to the supposition that a few may be resident on our coasts, as many certainly are in the Channel Islands. In its habits it differs but little from the Ringed Plover. Like that species it loves to frequent a sandy beach, especially selecting those spots which are strewn with shingle; but it is rarely or ever found far away from salt water.

Like the other Ringed Plovers this bird is not at all shy at its breeding-quarters, and will often allow the observer to approach it within a few yards as it runs restlessly along the sand or stands motionless on the shingle. It searches for its food close to the edge of the broken waves, often wading in the little pools, darting quickly to the left or right, snapping at the flies or tugging at the small worms half hidden in the sand. When flushed it usually flies quickly, with rapid beats of its wings, often running a few yards with wings expanded ere launching itself into the air. It is often seen in small parties of perhaps half a dozen; but more often a pair take up their residence in a certain part of the coast, seldom wandering far during the whole summer. The food of the Kentish Plover is principally composed of small marine animals, such as sand-worms, crustaceans, and small shell-fish. It also feeds on insects, often capturing them in the air. The alarm-note of this bird (which is constantly heard at the nest) resembles the syllable *ptirrr*. The call-note resembles the syllable *pitt*; this note is so rapidly repeated during the breeding-season that it becomes a trill, and is uttered as the bird soars for a considerable distance, flying round and round above its mate on the sands below.

The breeding-season of the Kentish Plover is in May. Although the bird does not exactly breed in colonies, numbers of its nests are made close together; and even where the bird is not common all the birds of a district often rear their young on the same suitable patch of coast. The nest is very simple, a little hollow scratched in the sand or amongst the shingle. This hole seldom or never contains any lining material, and the eggs are laid on the bare sand. Sometimes a site is selected amongst the drifted seaweed above the usual high-water mark. The eggs are three or four in number, and from the great resemblance they bear to the colour of surrounding objects they are difficult to find. They vary from

light to dark buff in ground-colour, and are spotted, scratched, and blotched with blackish brown, and with underlying markings of inky grey. Some eggs are much more richly coloured than others; some have the markings composed of blotches and spots, others of streaks, specks, and scratches. They vary in length from 1·35 to 1·15 inch, and in breadth from ·95 to ·85 inch. It is not easy to confuse the eggs of this species with those of any other British bird. Their much smaller size, darker colour, abundance and peculiarity of markings readily distinguish them from the eggs of the Ringed Plover; whilst their larger size and heavy character of markings distinguish them from those of the Little Ringed Plover. They do not differ much in size from eggs of the Lesser Tern, but are more pointed, and the surface-spots are smaller, more streaky, and darker in colour, whilst the underlying spots are smaller and fewer in number. When its breeding-grounds are intruded upon the Kentish Plover becomes very anxious, running before the observer, taking little flights, or even feigning lameness to try and allure him away. If the young are hatched its actions become even more anxious, and it will swoop round an intruder's head, uttering its plaintive note or flutter along the ground before him. The Kentish Plover does not sit very close; the instant danger threatens, the watchful male conveys the alarm to his brooding mate, and she leaves her eggs at once, conscious that their protective colouring will ensure their safety. Only one brood appears to be reared in the year.

I met with the Kentish Plover very abundantly on the islands in the lagoon of Missolonghi during the breeding-season, and also on the shores of the Black Sea.

The Kentish Plover differs from the Ringed Plovers previously described in many important particulars. The black ring round the neck is only represented by a black patch on each side of the breast; the black frontal patch is very similar, but the black line which runs through the lores is very obscure on the ear-coverts and altogether absent at the base of the upper mandible; the hind head and nape, instead of being of the same colour as the back, are buff; the general colour of the upper parts is paler, and the white shaft-streaks on the primaries much less developed; the four centre tail-feathers are brown and the remainder are white. Bill, legs, and feet black; irides hazel. In the female the parts which are black in the male are brown, and the hind head and nape have very slight traces of buff. After the autumn moult the male scarcely differs in colour from the female. Birds of the year resemble adults in winter plumage, except that the brown feathers have pale buff margins, and in the female the white on the forehead is suffused with brown. In young in first plumage the pale margins of the feathers are broader and more buff. Young in down closely resemble the young of the Ringed Plover, but are more buff.

The Killdeer Plover (*Charadrius vociferus*) has been included in the British list, but on unsatisfactory evidence. A mounted example of this bird, in a glass case, was brought to Mr. Sclater by Mr. J. R. Wise, who stated that it had been killed near Christchurch in Hampshire in April 1857, and was taken in the flesh to a local birdstuffer, by whom it was sold to its then owner, a Mr. Tanner (Sclater, 'Ibis,' 1862, p. 275).

The Killdeer Plover breeds throughout the United States of America and in Southern Canada. In the Southern States it is a resident, but to the Northern States and to Canada it is only a summer visitor, migrating in autumn to Mexico, the West Indies, Central America, and the northern portions of South America. It is said that a few remain to breed in Mexico and Jamaica. The fact that it passes the Bermuda Islands regularly on migration in small flocks makes it not improbable that it may occasionally visit the British Islands.

The Killdeer Plover is the American representative of our Greater Ringed Plover, though in some points it has a slight resemblance to the Dotterel. Its buff rump and upper tail-coverts recall the colours of that bird; and its habit of running over ploughed land and grass-fields is another point of resemblance. It is a gregarious bird. Allan Brooks and I met with a party of ten on the banks of a creek near his father's farm at Milton in Upper Canada, and watched them for some time. They run along the ground with great rapidity, sometimes wading in the water and occasionally jerking up their tails and nodding their heads like the Ringed Plover. They are very noisy birds, continually calling to each other, and, though it was autumn (the last week of August), we several times saw them fluttering with extended uplifted wings as they toyed with each other, uttering a trill like that of the Wood-Sandpiper or Temminck's Stint. Their ordinary call-note is a loud clear whistle, *tüt, tüt, tüt*, which, when they are alarmed or anxious, is lengthened out into a double note, *too-it*, plaintive and long drawn, which the imagination of the Canadian hunters has expressed by the name of "kill-deer." They can fly with great rapidity with wings bent at a considerable angle, but we had no difficulty in shooting a couple. One reason of the noisiness of the birds may have been the presence of a Buzzard and a couple of Harriers, which were sailing about over the creek.

The breeding-season of the Killdeer Plover commences, it is said, in the beginning of April in Louisiana, in the middle States in May, but in the Saskatchewan not until June. The nest is very simple, being nothing but a hollow in the ground, sometimes lined with a few scraps of herbage. The eggs are four in number, pale buff in ground-colour, blotched and spotted with dark blackish brown and underlying markings of greyish brown. The egg of this bird is figured on Plate 26. When their eggs or young are menaced by danger the old birds become very

anxious, and the female often feigns lameness. The food of the Killdeer Plover consists of worms, insects, small crustaceans, &c. It sometimes follows the plough to pick up larvæ and insects.

The Killdeer Plover bears a somewhat superficial resemblance to the Ringed Plover; but it is a slightly larger bird, with two black bands across the chest and a long wedge-shaped tail, the base of which and the rump and upper tail-coverts are chestnut-buff.

RINGED PLOVER.

CHARADRIUS MORINELLUS.

DOTTEREL.

(Plate 26.)

Pluvialis minor *sive* morinellus, *Briss. Orn.* v. p. 54 (1760).
Charadrius morinellus, *Linn. Syst. Nat.* i. p. 254 (1766); **et auctorum plurimorum**—*Bechstein, Temminck, Naumann, (Macgillivray), (Dresser), (Saunders),* &c.
Charadrius sibiricus, *Lepech. Itin.* pl. vi. (1771–80).
Charadrius tartaricus, *Pall. Reise Russ. Reichs,* ii. p. 715 (1773).
Eudromias morinella (*Linn.*),
Eudromias montana,
Eudromias stolida,
} *Brehm, Vög. Deutschl.* pp. 545–547 (1831).
Pluvialis morinellus (*Linn.*), *Macgill. Man. Brit. B.* ii. p. 50 (1842).
Morinellus sibiricus (*Lepech.*), *Bonap. Cat. Parzud.* p. 14 (1856).

The Dotterel is almost exclusively known as a bird on migration in England; but a few may possibly still stay to breed on some of the most secluded mountains in the Lake-district and the Cheviot range. It is much commoner in the eastern portions of England than in the western counties, and is very rare in Wales. Its favourite breeding-grounds in the British Islands are in the wildest parts of Scotland, on the lonely Grampians in North Perthshire and on the confines of Inverness-shire. It has also been found nesting in Ross-shire and the Orkneys, but to the Shetlands it only appears to be a visitor on migration. In the western portions of Scotland the Dotterel is only known as a rare straggler. In Ireland it is much less common than in England, and there is no evidence that it has ever bred in that country. It passes the Channel Islands sparingly on migration. The Dotterel probably bred years ago on some of the wildest hills in the south of England, but it has long since ceased to do so, having been exterminated by collecters and others. Even whilst on migration it is subject to incessant persecution, and naturally retires to those few chosen haunts in the wildest parts of Scotland where it can rear its young unmolested by man.

The Dotterel, like the Ringed Plover, is a Western Palæarctic bird, which has probably only recently extended its breeding-range into Asia. It breeds on the tundras above the limits of forest-growth from the Atlantic to the Pacific, and winters in Africa north of the equator. It passes through West Siberia, Turkestan, and Central Europe on migration, a few remaining to breed on the Alps, the mountains of Great Britain, and Scandinavia, and a few wintering on the northern shores of the Mediterranean. The Dotterel has never been known to occur in the

Oriental Region or in South-east Siberia; and its alleged occurrence in Japan (Cassin, Proc. Ac. Nat. Sc. Philad. 1858, p. 195) is probably based on a case of mistaken identity. The Dotterel has no very near ally.

Of all the Plovers, the Dotterel is my favourite. I first made its acquaintance whilst crossing the Dovrefjeld with my friend Collett, and remarked its tameness as it was feeding in small parties on the patches of cultivated land behind the farmhouse where we stopped to dine. Afterwards I occasionally met with it on the rocky fells near the North Cape, where it was evidently breeding amongst the lichens and creeping birches above the limit of forest-growth. Further east I watched a few pairs on the grassy hill that rises behind the deserted village of Stana-vialachta on the shores of the lagoons of the Petchora, and still further to the east I shot the adult and nearly fledged young on the tundras of Siberia, in lat. 71°, in the valley of the Yenesay. Elwes and I observed it on migration in Jutland; and everywhere it was the same charming little bird, allowing itself to be watched without showing any alarm. It has the reputation of being a very foolish bird, permitting itself to be approached very closely, and to be shot or driven into a net with very little trouble. It is even said that its name is derived from its proverbial foolishness, a "foolish dull person" being called a dotterel even before Willughby's time. It is more probable that the bird was so called before the name was transferred to the "foolish person." A *Dott*erel must not be regarded as a Plover in its *dot*age, but rather as a little bird which cries *dut* or *dote*, low, plaintive, and somewhat prolonged, whence its provincial name in some parts of Germany of "Dütschen." The Dotterel has another note, which may be represented by the syllable *drr*, and sometimes the two notes follow each other, *drr-dut*. In the pairing-season it has a trill or song.

The Dotterel is a late bird of passage, as might naturally be expected from a species breeding only above or beyond the limits of forest-growth, and seldom appears in this country before the end of April or the beginning of May. In spring it appears to migrate with great rapidity, probably passing from North Africa to North Europe in a single night, as scarcely any records of its vernal migrations are to be found from Central or Southern Europe. In autumn, however, it progresses much more leisurely; it crosses the Mediterranean at Malta during October and November, passing through Central Germany about a month earlier.

The Dotterel is essentially a bird of the fallows, and where there is no cultivated land it picks out the dry, bare places on which to feed. It avoids the swamps, and is seldom or never seen on the banks of rivers or lakes. The sea-shore has no attractions for the Dotterel, nor does it seem to care for pasture; but it loves to trip amongst clods of earth, and seeks its food on the bare mountain-sides. There it is very tame, and is much

easier to approach than any other species of Plover with which I am acquainted.

The Dotterel is quite as tame in its winter-quarters as it is on migration or in its breeding-haunts. Canon Tristram speaks of enormous flocks of these birds during winter in the hill-country of Southern Palestine, a district of rolling prairies or steppes of grass-land, but at that season so bare as to be called the wilderness. It abounded with myriads of white snail-shells of various species, upon which the Dotterels were feeding in company with an allied species, the Greater Sand-Plover (*C. geoffroyi*). They were so tame that they almost ran amongst the horses' feet.

This tameness does not arise from any deficiency in its powers of flight. On the ground the Dotterel looks somewhat heavy, and appears a short-necked, plump, little bird; but on the wing, as it dashes along with its long pointed pinions well bent, it might rather be regarded as the embodiment of speed.

The habits of the Dotterel at its breeding-grounds resemble very closely those of its congeners. A most interesting account of the breeding of this bird in the lake-district of Cumberland half a century ago was written by Mr. Heysham, and has been copied in most works on British birds since published. That naturalist described the arrival of the Dotterel in the neighbourhood of Carlisle in small flocks in the middle of May. For about a fortnight they frequented the fallows and the more barren pasture-land, after which they retired to the summits of the mountains to breed, where they remained in small colonies during the summer, seldom wandering far to feed. They made no nest, but deposited their eggs in a slight hollow on the mossy ground during the first half of June, though occasionally clutches of fresh eggs were found as late as July. Incubation lasted from eighteen to twenty days, in which the males took their turn with the females. They sat very close, and when flushed feigned lameness. Their principal food was beetles of various kinds, and whilst feeding they were very tame; but after the young were hatched they exhibited great anxiety for their safety, flying round the intruder with constant cries. About the middle of August they congregated into large flocks, and left their breeding-grounds early in September.

It is probable that the Dotterel still breeds on many of the mountains in the lake-district; and I have a series of eggs in my collection obtained from this locality not many years ago by my friend Mr. Frank Nicholson, who confirms, in most respects, the correctness of Heysham's observations.

An equally interesting account of the breeding of the Dotterel on a mountain-plateau on the borders of the counties of Perth and Inverness, in the middle of June 1873, was communicated by Major Feilden for insertion in Dresser's 'Birds of Europe,' and by Harvie-Brown, who accompanied him, to the Natural History Society of Glasgow. Ptarmigan

were breeding on the same ground, which was sprinkled over with granite boulders, the bare bog being almost concealed by innumerable little hummocks clad with soft moss, dwarf cranberries, and other alpine plants. After seeing the birds, they attempted to find the nest by a systematic search, which proved unsuccessful; but an hour or more later Captain Feilden returned to the place and succeeded, after a short time, in watching the bird to her nest. He described the habits as almost exactly resembling those of the Grey Plover, which Harvie-Brown and I observed and described under similar circumstances. Whilst he remained too near the nest the female simply flew from place to place around him; but on his removing to a greater distance she alighted on a hummock, looked round, ran along the narrow paths for some distance, when she again mounted a hummock to make further observations, and after passing backwards and forwards in a similar manner, finally stood still at the nest and settled down upon her eggs. She allowed him to approach very closely before leaving them, when she fluttered off as if wounded, remaining at no great distance, constantly uttering her plaintive note. The three eggs were placed in a hollow in the moss, with no lining of any sort.

The eggs of the Dotterel vary in ground-colour from greyish buff to ochraceous buff, with sometimes the faintest possible tinge of olive, and are blotched and spotted with rich dark brown and with underlying markings of inky grey. The surface-markings are generally large, concealing a large portion of the ground-colour, and are often confluent, especially on the larger end of the egg. Some eggs have the spots much larger than others, but on most of them they are pretty evenly distributed over the entire surface. The underlying spots are small and remarkably few in number. The eggs vary considerably in shape, some being almost as pointed at the large end as at the small, whilst others are pear-shaped; they vary in length from 1·75 to 1·5 inch, and in breadth from 1·17 to 1·1 inch. The only eggs of a British bird at all likely to be confused with those of the Dotterel are certain varieties of those of the Arctic Tern, some of which are almost indistinguishable from those of the Dotterel, but the latter have fewer and smaller underlying markings.

The food of the Dotterel consists principally of insects of various kinds, amongst which small beetles appear to be a special favourite. It also eats worms, grubs, and small grasshoppers, and the tender shoots of alpine plants have also been found in its stomach.

The difference in plumage between the sexes of this species has given rise to much difference of opinion amongst ornithologists. The earlier writers appear to have taken it for granted that the most brilliantly coloured bird was the male. Even Macgillivray and Montagu held this opinion. Naumann asserts that the plumage of the sexes is exactly alike, the variations being those of age, especially mentioning that he has shot

females in as brilliant plumage as that of the handsomest males. More modern ornithologists have advanced a step still further, and have come to the conclusion that the female is the more brilliantly coloured bird. It is probable that the last view is the correct one, and that the numerous brilliantly coloured males in collections have been incorrectly sexed. The explanation of such a remarkable fact is probably to be found in the circumstance that the male not only shares the duties of incubation with the female, but, after the young are hatched, takes even a more prominent part than she does in tending them. On the sole occasion when I had the good fortune to meet with unfledged young of this species, they appeared to be in charge of one bird only, which, on dissection, proved to be a male.

The adult female Dotterel in full breeding-plumage is a very handsome bird. The general colour of the upper parts is pale greyish brown, darker on the wings and tail; the shaft of the first primary is white, and the outer tail-feathers are broadly tipped with white; the wing-coverts, the innermost secondaries, and the scapulars are edged with rich buff; the crown and hind head are brownish black, the feathers of the forehead with pale margins; and from the base of the bill two broad white stripes extend, one over each eye, and join together on the nape. The chin and upper throat are white, and the cheeks and ear-coverts are white spotted with dark brown; the greyish brown of the back extends round the neck across the breast, where it suddenly ends in a white band, obscurely margined both above and below with nearly black; the underparts below the breast are rich chestnut, shading into nearly black on the belly, which abruptly changes into buffish white on the thighs, vent, and under tail-coverts; the axillaries and under wing-coverts are pale grey. Bill black; legs and feet dull yellowish brown, claws black; irides hazel.

The male differs from the female in having the black feathers of the head and the brownish-grey feathers of the mantle more or less margined with buff, and in having the black on the belly somewhat less developed. After the autumn moult the black of the head is much duller and more marked with buff, the eye-stripe and throat are buff, the white band with its black margins across the breast is absent, and the rest of the underparts are a uniform buffish white. In the young in first plumage the ground-colour of the upper parts is very much darker than in adults in winter plumage, the buff margins of the scapulars and innermost secondaries are more developed and are interrupted by almost black spots on the tips, the underparts are much more suffused with buff, the feathers of the breast have dark brown centres, and the dark belly is faintly indicated. Birds of the year are somewhat intermediate in colour between young in first plumage and adults in winter plumage. Young in down are buffish white, marked on the head, back, and wings with chestnut and black.

CHARADRIUS PLUVIALIS.

GOLDEN PLOVER.

(Plate 25.)

Charadrius apricarius, *Linn. Syst. Nat.* i. p. 150 (1758); *Bechst. Naturg. Deutschl.* iii. p. 203 (1793).
Pluvialis aurea, *Briss. Orn.* v. p. 43, pl. iv. fig. 1 (1760); *Macgill. Hist. Brit. B.* iv. p. 94 (1852).
Charadrius pluvialis, *Linn. Syst. Nat.* i. p. 254 (1766); **et auctorum plurimorum** —*Latham, Gmelin, Temminck, Salvin, Saunders, Dresser,* &c.
Charadrius aureus (*Briss.*), *Müll. Natursyst. Suppl.* p. 118 (1776).
Charadrius auratus, *Suckow, Naturg. der Thiere,* ii. p. 1592 (1801).
Charadrius altifrons, *Brehm, Vög. Deutschl.* p. 542 (1831).
Pluvialis apricarius (*Linn.*), *Bonap. Cat. Met. Ucc. Eur.* p. 57 (1842).

The Golden Plover is very local in England, during the breeding-season, south of Derbyshire. It is said to breed in the extreme south-west of England and in several localities in Wales, but its true home is on the moors and mountains of the north. In all suitable situations, from the Grouse-moors of Derbyshire northwards to the Orkney and Shetland Islands, it is more or less abundant during summer. In winter it is much more widely dispersed, frequenting all the coasts and many of the inland districts. In Ireland it is generally distributed, breeding on all the suitable moors and high lands.

The chief breeding-places of the Golden Plover are the fjelds of Norway and the tundras of Russia and Siberia as far east as the valley of the Yenesay; it also breeds sparingly on similar ground as far south as the moors of Holland, Belgium, and North Germany. In the rest of Central and Southern Europe it is principally known as passing through on migration, a few remaining over the winter. Its principal winter-quarters are the basin of the Mediterranean, whence it occasionally straggles to Madeira and as far south as the Cape. The Siberian birds appear to pass through Turkestan on migration, a few remaining to winter in Baluchistan; but the greater number probably migrate as far as Africa. It is a common summer visitor to Iceland and the Faroes, and has been said to have occurred in Greenland. In the valley of the Yenesay a nearly allied species (*C. fulvus*) breeds, which, as it has once occurred in our islands and also in Heligoland, is included in the British list.

The true haunt of the Golden Plover is on the wide far-extending moors and open wastes, on the mountain-heaths and breezy uplands. It is a bird

of the tundra, and loves to frequent the wildest districts in our islands. To the tundras and fjelds of Northern Europe it is a migrant, reaching its favourite breeding-grounds about the middle of May; but in this country its eggs are already laid at that date. I noticed that in the valley of the Petchora the Golden Plover frequented totally different ground from the Grey Plover, haunting the round exposed knolls in preference to the flat bogs, and being almost always found where the tundra had more of the rolling character of prairie, intersected by willow patches and miniature valleys, narrow deep streams of pure sparkling water, and clear tarns surrounded by brushwood. The Golden Plover makes itself one of the most conspicuous birds on the moors. No sooner does the observer set foot on these interminable wilds than the birds rise here and there from different parts of the heath and fly towards him, sometimes alighting within a few yards of him. Although to some extent a wary bird, much of its shyness disappears in spring, and it may often be noticed at this season running lightly amongst the heath or standing quietly with head erect on some tuft of grass intently watching the intruder. In early spring Golden Plovers may frequently be observed in large flocks passing towards the moors or even on the moors, where if alarmed they rise in the air and wheel and turn in a peculiarly graceful manner. These flocks soon disperse, and scatter themselves over the moors in pairs for the purpose of breeding. The flight of the Golden Plover is powerful and well sustained; it is not so erratic as the flight of the Peewit, and is performed with moderately quick beatings of the wings. When on migration or in passing from place to place, as is oft their wont in winter, the flock generally takes the shape of a wedge.

The Golden Plover is an active bird on the ground, where it both runs and walks. A flock of these birds feeding on a stretch of open sand is a very pretty sight. Every now and then one or two pause in their labours for a moment, and with head erect look warily around. Nimbly they run to and fro, sometimes wading in the shallows, or standing motionless as if lost in thought. At the approach of danger the alarm-note sounds and the whole flock takes wing, sometimes rising to a great height, where they perform various aerial movements and then descend on another part of the shore. Upon the moors the Golden Plover may often be observed in the wild broken pastures searching for its food, and not unfrequently it is flushed from the large patches of coarse cotton-grass which here and there dot the heathy wilds. The food of this bird in summer consists principally of worms and insects. It searches the swampy parts of the moors, and probes the heaps of manure, or often catches an insect as it flits past. Dixon once watched a small party of these birds in Skye that were feeding on the maggots which infested a dead sheep. It was a curious sight to see them running nimbly over the sheep's body, some half hidden

amongst the wool and flesh, and all so eager in their search as to allow him to approach within a few feet ere they took wing. In winter, when they have for the most part deserted the moors, and seek their food on the coast, they chiefly subsist on various marine animals; but in mild open weather they frequent the pastures adjoining the sea to search for worms, grubs, &c. Vegetable fragments, small seeds, and small pieces of gravel are sometimes found in its stomach. In autumn the low-lying eastern coasts of England often swarm with these birds, which appear to feed almost exclusively at night, especially when the moon is near the full.

There are few sounds more in harmony with their surroundings than the notes of the Golden Plover. The alarm-note is a plaintive *kö*, scarcely distinguishable from that of the Grey Plover, and the call-note is a double *kl-ēē*; whilst in the pairing-season, when the male is fluttering in the air above his mate, the note is repeated so rapidly that it becomes a trill. Both birds call on the ground as well as in the air. It is astonishing at what great distances the whistle of the Golden Plover may be heard on the moors, its shrill clear tones being quite distinct when the birds themselves appear little more than specks hovering and fluttering in the blue hazy distance.

In the British Islands the breeding-season of the Golden Plover commences about the second week in May, sometimes a little earlier, sometimes a little later, according to the state of the season. Although the flocks of these birds disperse in spring, throughout the breeding-season the Golden Plover is more or less sociable and may repeatedly be seen in parties. Several pairs, as a rule, nest in the same vicinity. The nest is rather larger, deeper, and better made than that of the Lapwing, and is composed of bits of dry herbage and scraps of heath and moss, arranged in a small depression in the ground or on the top of a tuft, or in a clump of cotton-grass. The eggs are four in number and are very beautiful. They vary in ground-colour from pale buff to rich buff, with occasionally a tinge of olive, and are spotted and blotched with rich purplish brown and brownish black. The underlying markings are comparatively few, very small, and inky grey. The larger markings are generally most numerous on the large end of the egg. Many of the blotches are confluent and cover a large portion of the egg; but occasionally the markings are small, varying in size from that of a pea to fine shot. They are pyriform in shape, and vary in length from 2·2 to 1·95 inch, and in breadth from 1·5 to 1·3 inch. Eggs of the Golden Plover may generally be distinguished from those of the Lapwing and Grey Plover by their much brighter colour, the ground-colour is clearer and less olive, and the markings are richer. As a rule, they are slightly larger in size than those of the Lapwing.

When the breeding-grounds of this bird are invaded, the anxious parents

try by many a clever artifice to lure the intruder away from their treasured eggs or young. The males often allow a near approach as they stand like watchful sentinels on the heath or grass-tufts, merely running on a little distance, or they take wing with a mournful note, to wheel round and round, or swoop down again to the ground to stand and watch as before. The warning note soon brings the female upon the scene. Unnoticed she quietly slips off her eggs and leaves them to the safety that their protective colour insures. If they have young they are often even more demonstrative, and try by reeling and tumbling along the ground to concentrate all attention upon themselves. At the least alarm the downy little young ones scurry off in all directions, and crouch low and motionless amongst the heather and moss, where it is very difficult to find them, so closely does the colour of their down harmonize with the surrounding tints. The female is ever closely attended by the male, and on one occasion a male bird was shot from the eggs. The young run as soon as they are hatched, and are carefully tended by their parents for several weeks. Only one brood is reared in the season; but if the first eggs are destroyed others are usually laid.

As soon as the young are able to fly, the Golden Plovers collect into large flocks for the winter, although they do not quit the moors until the weather becomes inclement. During winter these flocks frequent the marshes and coasts, feeding either on the pastures near the sea or on the tide-washed mud-flats. During dark nights they leave the coast and generally betake themselves to the adjoining pastures or higher land, returning at daybreak. The flocks that congregate at this season are often of immense size, containing many thousands of birds. If shot at they often swoop to the ground with great rapidity, then rise again, often tarrying to hover above their fallen comrades and sing their dirge with their melancholy note. Most of the Golden Plovers that frequent the English coasts in autumn and winter are migrants from Northern Europe. Vast numbers pass Heligoland every year on their way south from their breeding-grounds on the fjelds and tundras—some to cross the German Ocean and winter on our coasts, others to pass south along the European coast-line to Spain and thence to Africa. On the east coast of England the numbers of Golden Plover that arrive are almost incredible. Towards the end of October and early in November they are often seen flying down coast for days together, flock succeeding flock as the grand army of migrants pass on. Golden Plover often congregate with other wild fowl, especially with Curlews, Dunlins, and Lapwings. Their flesh is highly prized as an article of food, and consequently the poor birds are harassed incessantly by the coast-gunners. The Golden Plover becomes very restless at the approach of stormy weather, and usually retires inland before the storm arrives.

In the adult male Golden Plover in breeding-plumage the upper parts are nearly black, spotted with yellow; the forehead, eye-stripe, sides of the neck, axillaries, thighs, flanks, and under tail-coverts are white, mottled here and there with dusky; and the chin, throat, breast, and belly are black. Bill, legs, feet, and claws nearly black; irides dark hazel. The female has the white parts more mottled with dusky than the male, and the black on the underparts is browner and mixed with white feathers. After the autumn moult but little change appears in the upper parts, but the underparts are white, mottled with brown on the breast and flanks. Young in first plumage closely resemble adults in winter plumage, but the breast and flanks are more profusely mottled with brown, and the former is suffused with buffish yellow. This plumage is slowly moulted in autumn, birds of the year being intermediate in colour between young in first plumage and adults in winter plumage. Young in down are yellow above, spotted and blotched with black, and are nearly white beneath.

WATCHING GREY PLOVERS THROUGH A CLOUD OF MOSQUITOES.

CHARADRIUS FULVUS.

ASIATIC GOLDEN PLOVER.

(Plate 25.)

Charadrius fulvus, *Gmel. Syst. Nat.* i. p. 687 (1788); **et auctorum plurimorum**—*Swinhoe, Hume, Salvadori, Dresser, Oates,* &c.
Charadrius xanthocheilus, *Wagl. Syst. Av.* sp. 36 (1827).
Charadrius taitensis, *Less. Man. d'Orn.* ii. p. 321 (1828).
Charadrius glaucopus, *Licht. Forster's Descr. Anim. It. Mar. Austr.* p. 176 (1844).
Charadrius pluvialis orientalis, *Temm. et Schlegel, Faun. Japon.* p. 104 (1847).
Pluvialis longipes, *Temm. fide*
Pluvialis xanthocheilus (*Wagl.*),
Pluvialis taitensis (*Less.*),
Pluvialis fulvus (*Gmel.*),
} *Bonap. Rev. Crit.* 1856, p. 417.
Charadrius dominicus fulvus, *Ridgway, Proc. U. S. Nat. Mus.* iii. p. 198 (1880).

The Asiatic Golden Plover was first discovered by Dr. Forster, who found it on the shores in marshy places on Otaheite, one of the Society Islands. This celebrated traveller accompanied Captain Cook on several of his voyages, and collected a valuable series of drawings of birds, which are now deposited in the British Museum. The claim of this species to a place in the British list rests upon a single example, which was procured in 1874. It was noticed by Mr. Bidwell, in December of that year, in Leadenhall Market, whence it had been sent from Norfolk with a number of Golden Plovers. Mr. Bidwell communicated his discovery to Mr. Dresser, who identified the species, and in whose collection the example now is (Dresser, Ibis, 1875, p. 513).

The Asiatic Golden Plover breeds* on the tundras of Eastern Siberia, from the valley of the Yenesay to the Pacific. It passes through Japan, South Siberia, and Mongolia on migration, and winters in India, the

* Swinhoe's statement that the Eastern Golden Plover breeds on the island of Formosa (Ibis, 1863, p. 404) is unquestionably an error. The eggs which he obtained are now in my collection, and do not differ from eggs of *Rhynchæa bengalensis*, and are not half the size of the true eggs of the Eastern Golden Plover, which I obtained more than three thousand miles further to the north. Layard's statement (Ibis, 1879, p. 107) that the Eastern Golden Plover breeds on New Caledonia cannot be regarded as evidence, as the bird was only seen and not obtained; and though the statement is reiterated (Ibis, 1881, p. 135), the almost unanimous verdict of ornithologists is that the alleged fact is possible, but not probable. It is a great pity that Oates (Birds of Brit. Burmah, ii. p. 365) should have propagated Swinhoe's error, which I corrected (Ibis, 1879, p. 154), and which was quoted and confirmed by Legge (Birds of Ceylon, p. 936). These errors have probably arisen from the fact that immature birds, which have not yet begun to breed, of this and other allied species, occasionally remain in their winter-quarters throughout their first summer.

Burma peninsula, China, the islands of the Malay archipelago, Australia, and the islands of the Pacific Ocean. It has been known to stray as far as New Zealand in the east, and to the Mekran coast, Malta, Algeria, Poland, and Heligoland in the west.

The Eastern Golden Plover is represented on the American continent by a species so nearly allied to the Asiatic bird that there can be little doubt that it is conspecific with it. The American Golden Plover (*Charadrius virginicus*) is a slightly larger bird, varying in length of wing from 6·8 to 7·5 inch, the wing of the Asiatic species varying from 6·0 to 6·7 inch. The innermost secondaries of the American bird are supposed to be relatively shorter, the distance from their tips to the tip of the wing varying from $1\frac{1}{2}$ to 2 inch, whilst in the Asiatic species this distance usually measures only from 0·5 to 0·8 inch. What appear to be intermediate forms occur on the Pacific coast of Asia. Examples from Japan, China, Formosa, Hainan, Borneo, and Cape York vary in length of wing from 6·2 to 6·9 inch, and in distance from the tips of the innermost secondaries to the tip of the wing from 1·2 to 2·3 inch. The American form has occurred on Heligoland (Seebohm, Ibis, 1877, p. 165), and an example was purchased in Leadenhall Market, in London, on the 10th of November, 1882. I examined it in the flesh; it was quite fresh, but it is impossible to say where it was killed (Gurney, Ibis, 1883, p. 198).

The Asiatic Golden Plover, like its cousin the Common Golden Plover, is a bird of the tundra, frequenting the vast solitudes that are such a characteristic feature of the Arctic regions. It spends its winters in southern latitudes, and arrives on these Arctic tundras as soon as the south wind melts the snow and calls the slumbering country into life. In its habits it very closely resembles its near ally in Europe. It walks and runs about the ground, or wades into the shallows in search of its food, which consists principally of insects, worms, and slugs in summer, and of various small marine animals, insects, &c. in winter. Its flight is very similar to that of the Golden Plover, and it possesses the same habit of going in flocks or small parties.

I first made the acquaintance of the Asiatic Golden Plover on the Arctic circle in the valley of the Yenesay. I shot my first specimen on the 5th of June in our winter-quarters on the river, and afterwards secured many more specimens as it passed the Koo-ray-i-ka on migration. I did not observe it again until we reached lat. $69\frac{1}{2}^{\circ}$ on the open tundra, just beyond the limit of forest-growth. Not a trace of a pine tree was to be seen, and the birch trees had dwindled down to stunted bushes scarcely a foot high. On the 14th of July, as we were delayed in our passage down the river by a gale, I took advantage of the delay and went on shore for a few hours. A climb of about a hundred feet brought me to the tundra. I took a nest of the Dusky Ouzel with young birds as I climbed up the

steep bank where alders and willows still flourished luxuriantly, and had scarcely reached the top before I heard the cry of a Plover. The tundra was hilly, with lakes and swamps and bogs in the wide valleys and plains. I found myself upon an excellent piece of Plover-ground, covered more with moss and lichen than with grass, sprinkled with patches of bare pebbly earth, and interspersed with hummocky plains, where ground-fruits and gay flowers were growing. I soon caught sight of both male and female, and sat down with the intention of watching the latter to the nest. After wasting half an hour, during which the bird wandered uneasily round and round me, without showing any partiality for a special locality, I came to the conclusion, either that the eggs were hatched, in which case my watching was in vain, or that I was so near the nest that the female dare not come on. The male had a splendid black belly; and I decided to take my first good chance of a shot at him, and then to devote another half-hour to a search for the nest. All my attempts to follow the female with my glass, in order to trace her to the nest, proved ineffectual; she was too nearly the colour of the ground and the herbage was too high. Feeling convinced that I was within thirty paces of the nest, I shot the male and commenced a diligent search. He proved to be, as I suspected, the Asiatic Golden Plover with grey axillaries. By a wonderful piece of good fortune I found the nest with four eggs in less than five minutes; it was merely a hollow in the ground, upon a piece of turfy land, overgrown with moss and lichen, and was lined with broken stalks of reindeer-moss.

At Golcheeka the Asiatic Golden Plover was very common, and I tried to watch several birds to the nest, but in every case without success; they behaved exactly as if they had young. I succeeded in catching one young bird in down, and reluctantly came to the conclusion that I was too late, on the 20th of July, for eggs. The eggs of the Asiatic Golden Plover are very similar to those of the European species. Those I obtained (the only authentic specimens known to exist) vary in ground-colour from light buff to very pale buff with a slight olive tinge, blotched and spotted with rich brown. Some eggs have the markings irregular, and many of the blotches are confluent, whilst other examples have most of the markings round the large end. The grey underlying markings are small and comparatively few in number. The character of the markings is precisely similar to those on the eggs of the Common Golden Plover. They vary in length from 1·92 to 1·85 inch, and in breadth from 1·32 to 1·27 inch. The eggs of this bird very closely resemble those of the Common Golden Plover, but are slightly smaller.

The note of the Asiatic Golden Plover is very similar to that of the Grey Plover. Its commonest note is a plaintive *kö*; occasionally the double note *kl-ēē* is heard, but more often the treble note *kl-ēē-kö* is uttered. In its southern winter-haunts the Asiatic Golden Plover congregates into large

flocks, and directly after its arrival it is said to be very tame, but eventually gets much shyer, although it is never a very wary bird. Captain Legge says that in Ceylon, where great numbers of this bird winter, it is very fond of frequenting bare fields, and is usually found in flocks composed of about thirty or forty individuals, which spread themselves over a considerable extent of ground, running hither and thither and every now and again snapping at the insects as they flit past. It congregates in vast flocks on the muddy shores of that island, where its movements are said to be greatly affected by rain. Like its European representative it often associates with other Waders, and in Ceylon is almost always seen in company with the Mongolian Sand-Plover. It possesses the peculiar habit of running a little way when approached and then standing still, with its body turned away from the observer and its head twisted on one side, where it will remain for some time, when, if still pursued, it runs a little distance with outspread wings and then flies away. The whole flock when alarmed sometimes fly with great rapidity, swooping down to the earth and then rising again. In their winter-quarters in Borneo it is said that they frequent the bare muddy places where buffaloes bathe, and when disturbed that they generally perch in some bare stony place. Swinhoe found this species in China in the dry rice-fields and sweet-potatoe gardens, as well as on the beach. They appear to journey to and from their breeding-grounds in large flocks.

The adult Asiatic Golden Plover in full breeding-plumage only differs from the same plumage of the Golden Plover in having grey instead of white axillaries. After the autumn moult, which progresses very slowly, beginning in August and frequently lasting until November, the winter plumage is assumed: this differs widely from that of the Golden Plover, though it resembles very closely that of the Grey Plover, the spotted feathers of the upper parts being replaced by feathers having yellow margins. Young in first plumage resemble on their upper parts adults in spring plumage, except that the tail-feathers, instead of being dark brown with transverse bars of pale brown, are uniform dark brown with marginal yellow spots. The underparts of the young in first plumage resemble very closely those of adults in winter plumage, but are more suffused with yellow, and the flanks are obscurely barred with brown. In this species it seems that the young moult at the same time as their parents, so that during their first winter they are in the plumage of birds of the year, which only differs from that of the adult in being more suffused with yellow on the underparts. The young in down are scarcely distinguishable from the young in down of the Golden and Grey Plovers. The Asiatic Golden Plover may be distinguished at all ages and seasons from all its allies, except the American Golden Plover, by its grey axillaries.

CHARADRIUS HELVETICUS.

GREY PLOVER.

(Plate 25.)

Vanellus griseus, Vanellus varius, Vanellus helveticus, *Briss. Orn.* v. p. 100 (1760, early spring dress). p. 103 (1760, bird of the year). p. 106 (1760, adult summer).
Tringa helvetica, *Linn. Syst. Nat.* i. p. 250 (1766); **et auctorum plurimorum**—*Latham*, (*Temminck*), (*Jerdon*), (*Dresser*), (*Saunders*), &c.
Tringa varia, Tringa squatarola, *Linn. Syst. Nat.* i. p. 252 (1766).
Charadrius hypomelus, *Pall. Reise Russ. Reichs*, iii. p. 699 (1773).
Charadrius nævius, *Gmel. Syst. Nat.* i. p. 692 (1788).
Vanellus melanogaster, *Bechst. Naturg. Deutschl.* iv. p. 356 (1809).
Squatarola grisea, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 29 (1816).
Squatarola squatarola (*Linn.*), *Cuv. Règne An.* i. p. 467 (1817).
Squatarola varia (*Briss.*), *Boie, Isis*, 1822, p. 558.
Charadrius pardela, *Pall. Zoogr. Rosso-Asiat.* ii. p. 142 (1826).
Squatarola cinerea, *Fleming, Brit. An.* p. 111 (1828).
Charadrius squatarola (*Linn.*), *Naum. Vög. Deutschl.* vii. p. 249 (1834).
Squatarola melanogaster (*Bechst.*), *Malh. Faun. Orn. Sicil.* p. 166 (1840).
Squatarola helvetica (*Briss.*), *Keys. u. Blas. Wirb. Eur.* p. 207 (1843).
Vanellus squatarola (*Linn.*), *Schl. Rev. Crit.* p. lxxxiv (1844).
Charadrius helveticus (*Briss.*), *Kjærb. Naum.* 1850, p. 6.
Pluvialis squatarola (*Linn.*), *Macgill. Hist. Brit. B.* iv. p. 86 (1852).
Squatarola wilsoni, *Licht. Nomencl. Av.* p. 95 (1854).
Squatarola rhynchomega, *Bonap. Compt. Rend.* xliii. p. 416 (1856).
Pluvialis varius (*Briss.*), *Degl. & Gerbe, Orn. Eur.* p. 127 (1867).
Charadrius varius (*Briss.*), *Finsch & Hartl. Vög. Ost-Afr.* p. 644 (1870).

The Grey Plover is found more or less commonly on the coasts of the British Islands, chiefly during autumn migration, but occasionally in winter and spring. It is far less numerous on the west coasts than the east. It frequents in small numbers the inner islands on the west coast of Scotland, but only occurs sparingly in the Outer Hebrides. In Ireland it is still less common, although it appears regularly every season.

The Grey Plover is a circumpolar bird, but has only been known to breed on the tundras above the limit of forest-growth. It appears to be very local in its distribution during the breeding-season. It is not known with certainty to breed anywhere except in the lower valley of the Petchora, on the Taimyr peninsula in the extreme north of Siberia, in Alaska, on the banks of the Anderson river, and on Melville Peninsula. It passes through Central and Southern Europe on migration, and winters in the

basin of the Mediterranean and in Africa north of the equator. The eastern birds pass through South Siberia, Turkestan, Mongolia, and Japan on migration, and winter in India, South China, the islands of the Malay archipelago, and Australia. In the New World its range has not been so accurately determined, but it is known to winter in the West Indies and in several parts of South America. The Grey Plover has no very near ally.

British ornithologists only have the opportunity of studying the habits of the Grey Plover during the autumn and winter, when it is to be found on the coasts of our islands. Young birds make their appearance in August and September, sometimes having remains of down still attached to their feathers, accompanied by only a few old birds, the main body of adults delaying their arrival until October and November. They leave our coasts in spring, in May, a few remaining until early in June, and stray examples have been occasionally met with in July, probably immature birds.

The Grey Plover is more of a coast-bird than the Golden Plover, and during the whole time of its stay with us prefers the low-lying shores, the mud-flats, salt-marshes, and river-mouths, where it obtains an abundant supply of food. It is often met with in solitary pairs, and less frequently in parties of perhaps thirty or forty individuals. One or two birds often keep company with a flock of other Waders, such as Dunlins or Knots. It is more wary than the Golden Plover, and consequently far more difficult to approach. It is an engaging lively bird, running or walking gracefully about the mud or sand, every now and then pausing a moment, and with head erected looking warily around. When alarmed it generally runs with uplifted wings for a little distance ere taking flight. It flies with great rapidity, and often indulges in the same aerial movements as the Golden Plover. It obtains much of its food at dusk, and is especially active on moonlight nights. Its food consists of small worms, shells, and a variety of marine animals, which it picks from the masses of seaweed, or even wades into the shallow water to secure; it also eats various insects and grubs.

The eggs of the Grey Plover were one of the few prizes which Wolley failed to secure during his three summers in Lapland. They were first discovered in 1843 by Middendorff, the great Russian traveller, who found them on the Taimyr peninsula, in Siberia, in lat. 71° and 74°, the first nest being taken on the 8th of July. The Smithsonian Institution at Washington obtained examples, collected by MacFarlane on the American coast of the Arctic Ocean in 1864, which remained unique in collections for ten years; but in 1875 Harvie-Brown and I took ten nests between the 22nd of June and the 12th of July in the valley of the Petchora, in lat. 68°. It is not known that any authentic eggs of this interesting bird have been taken during the last ten years. The interest attaching to this

discovery of the only eggs of the Grey Plover known to have been taken in Europe induces me to extract the following account of it from my 'Siberia in Europe,' which was written for the most part on the spot:—

When Harvie-Brown and I planned our expedition to the Petchora we thought it was within the range of possibility that we might return with eggs of the Grey Plover. As the migratory birds began to arrive at Ust Zylma we kept a sharp look-out for the Grey Plover as one of the specialities of our trip. On the 17th May, the second day of summer, the Golden Plover arrived. We carefully examined every flock that passed us, and never lost an opportunity of shooting a bird; but as all the migratory birds arrived one after another without any signs of the Grey Plover, we gradually gave up the hope of obtaining their eggs. Nor did our journey down the river do much to reassure us. At Pustazursk (or, as the Russians on the Petchora call it, Gorodok, or *the* town) we found the Golden Plover, but no signs of the Grey Plover. One fact, however, encouraged us. In the delta of the Petchora we found several species of birds in considerable numbers, and unquestionably migratory birds, which we had not seen in Ust Zylma, and which could not possibly have passed through in such numbers without our having seen something of them. It was perfectly obvious that Ust Zylma was somewhat out of the line of migration, and that the majority of birds intending to breed on the tundra followed the valley of the Petchora as far as the Ussa, and then struck direct across the comparatively flat country to their breeding-places or followed the coast-line.

We arrived at Alexievka on the evening of the 19th of June, and on the 22nd crossed the river to the land of promise, the Aarka Ya of the Samoyedes, the Bolshya Zemlia of the Russians, the mysterious tundra, which we pictured to ourselves as a sort of ornithological Cathay. We mustered seven altogether—our two selves, our interpreter Piottuch, and our crew of four, two Russians, a Samoyede, and a halfbreed. It was a bright warm day; the wind had dropped; and it was too early in the season for the mosquitoes to be troublesome. The tundra forms the east bank of the Petchora; and we had to climb up a steep cliff (perhaps 60 feet high), a crumbling slope of clay, earth, sand, gravel, turf, but no rock. We looked over a gently rolling prairie country, stretching away to a flat plain, beyond which was a range of low rounded hills, some eight or ten miles off. It was in fact a moor with here and there a large flat bog, and everywhere abundance of lakes. For seven or eight months in the year it is covered with from two to three feet of snow. Snow was still lying in large patches in the more sheltered recesses of the steep river-banks; and on one of the lakes a large floe of ice, six inches thick, was still unmelted. The vegetation on the dry parts of the tundra was chiefly sedge, moss, and lichen, of which the familiar reindeer-moss was especially

abundant. In some places there were abundance of cranberries with last year's fruit still eatable, preserved by the frost and snow of winter. Here and there we met with a dwarf shrub not unlike a rhododendron, with a white flower and aromatic-scented leaves (*Ledum palustre*), a heath-like plant with a pale red flower (*Andromeda polifolia*), and dwarf birch (*Betula nana*) running on the ground almost like ivy. The flat boggy places had evidently been shallow lakes a few weeks ago after the sudden thaw, and were now black swamps, in the middle grown over with yellow-green moss, and full of sedge towards the margin. They were separated from each other by tussocky ridges of moor, which intersected the plain like the veins on the rind of a melon. We found no difficulty in going where we liked; our india-rubber waterproofs were all-sufficient. We crossed the wettest bogs with impunity, seldom sinking more than a foot before reaching a good foundation, a solid pavement of ice. Birds were but thinly scattered over the ground; but there were sufficient to keep our curiosity on the *qui vive*. The commonest bird was the Lapland Bunting; and we took two of their nests in the tussocky ridges between the little bogs. The next commonest bird was the Red-throated Pipit; and we took two of their nests in similar positions. As we marched across the tundra we fell in with some Dunlins, and took a couple of their nests. This was encouraging. The Dunlin was a bird we had not seen at Ust Zylma, and one possibly that migrated direct across country from Ust Ussa.

We had not walked more than a couple of miles inland before we came upon a small party of Plovers. They were very wild, and we found it impossible to get within shot of them; but a distant view through our binoculars almost convinced us that we had met with the Grey Plover at last. We had not walked very far before other Plovers rose; and we determined to commence a diligent search for the nest, and offered half a rouble to any of our men who should find one. Our interpreter laughed at us, and marched away into the tundra with a "C'est impossible, Monsieur." We appealed to our Samoyede, who stroked his beardless chin, and cautiously replied "mōzhna" (possible). The other men wandered aimlessly up and down; but the Samoyede tramped the ground systematically, and after more than an hour's search found a nest on one of the dry tussocky ridges intersecting the bog, containing four eggs about the size and shape of those of the Golden Plover, but more like those of the Lapwing in colour. The nest was a hollow, evidently scratched, perfectly round, somewhat deep, and containing a handful of broken slender twigs and reindeer-moss. Harvie-Brown concealed himself as well as he could behind a ridge to lie in wait for the bird returning to the nest, and after half an hour's watching shot a veritable Grey Plover.

Soon afterwards another of our men found a second nest, also containing four eggs, in exactly a similar situation. Harvie-Brown took this nest

also in hand, and in about an hour succeeded in shooting the female. The third nest was found by the Samoyede. This time I lay down behind a ridge some thirty yards from the nest, and after waiting a quarter of an hour caught sight of the bird on the top of a distant tussock. Presently she ran nearer to another ridge, looked round, and then ran on to the next, until she finally came within fifty yards of where I was lying. I had just made up my mind to risk a shot when she must have seen me, and flew right away. In a quarter of an hour I caught sight of her again, approaching by short stages as before, but from an opposite direction. I must have been in full sight of her. When she had approached within fifty yards of me, as near as I could guess, I fired at her with no. 4 shot and missed. I remained reclining where I was, with little hope that she would make a third attempt to approach the nest, and whiled away the time with watching a Buffon's Skua through my glass as it cautiously approached in my direction. Turning my head round suddenly I caught sight of the Grey Plover running towards the nest within fifty yards of me. I lifted my gun and fired again, but was so nervous that I missed her a second time. I was so vexed that I got up and walked towards the Skua, which still remained *in statu quo*. I missed a shot at it too, spent some time in a vain search for its nest, and returned to my old quarters. In ten minutes I saw the Grey Plover flying up. It wheeled round in my direction, coming almost within shot, and evidently took stock of me, and satisfied itself that I was a harmless animal practising with blank cartridge, having no evil design upon its eggs. It alighted about fifty yards beyond the nest, and approached less timidly than before. When it came within fifty yards of me I fired, this time with no. 6 shot, and laid the poor bird upon its back. As we returned to our boat Harvie-Brown found a fourth nest, and, after watching as before, secured the bird. We accidentally broke two of the eggs belonging to the third nest, but reached Alexievka at midnight with fourteen identified Grey Plover's eggs. Two sittings were quite fresh, and made us an excellent omelette for breakfast the next morning. The other two were very slightly incubated.

From the 25th to the 28th of June we made an excursion to Stanavialachta, some forty versts lower down the river. The tundra in this locality was more hilly, and we did not find any of the dead flat bog which the Grey Plover frequents; consequently we did not meet with any of these birds; but the Golden Plover was common enough, and we took two of its nests.

On the 3rd of July we took advantage of a cold north-east wind, which banished the mosquitoes for a time, to cross over to the tundra again to renew our search for Grey Plover's eggs. We soon heard the note of the birds of which we were in search, and saw two or three, but could not discover any signs of their having a nest. After our previous experience we decided to vary our tactics. Hitherto we had found the nests by sheer

perseverance in searching, and had afterwards watched the female to the nest and shot her. We now decided to watch her to the nest in the first instance, and, having by this means found it, to secure her afterwards as a further and more complete identification of the eggs. It was also perfectly obvious that the extreme care we had taken not to alarm the bird was unnecessary. Our little manœuvre of walking away from the nest in a body, leaving one behind lying flat on the ground to watch, under the impression that the bird could not count beyond three, and would think that we had all gone, was clearly so much artifice wasted. The birds were evidently determined to come back to their nests in spite of our presence; nor was there any cover to hide us if the contrary had been the case. Our care not to handle the eggs until we had secured the bird was also unnecessary, as we often proved afterwards. On a marshy piece of ground I shot a Reeve; and then we struck across a very likely piece of land, little flat pieces of bog with mossy ridges between.

Presently Harvie-Brown, who was in front, whistled, and as I was coming up to him I saw a Grey Plover on my left. He called out to me that he had put up a pair near where he was standing. I soon caught sight of another bird on the ground, lifting its wings as if to attract me from its nest. It then quietly ran off; and I went to the spot—but finding nothing, lay down to watch. Harvie-Brown did the same about eighty yards off. It was not long before I caught sight of both birds at some distance. One, which I at once concluded must be the male, remained in the same spot; the other was running towards me, stopping on some elevation every few yards to look round. By-and-by it flew between Harvie-Brown and me, and alighted on the other side of me. The other bird soon followed, and remained as before, apparently watching the movements of the restless bird, which I now felt sure must be the female. To this latter bird I now confined my attention, and kept it within the field of my telescope for more than half an hour. It was never still for more than a minute together; it kept running along the ground for a few yards, then ascending one of the ridges, looking round and uttering its somewhat melancholy cry. It crossed and recrossed the same ridges over and over again, and finally disappeared behind a knoll about forty yards ahead of me, and was silent. I carefully adjusted my telescope on a hillock to bear upon the place in case I lost it, and was just making up my mind to walk to the spot when I again heard its cry and saw it running as before. The male was still *in statu quo*. The crossing and recrossing the ridge upon which my telescope was pointed continued for another quarter of an hour, and at last the bird disappeared behind the same ridge as before. I gave her a quarter of an hour's grace, during which she was perfectly silent, and then sat up to see if Harvie-Brown was satisfied that she was on the nest. His point of view was not so favourable as mine;

and thinking I had given up the watch as hopeless, he fired off his gun as a last resource, and came up to me. As soon as he fired, both birds rose almost exactly in front of the knoll upon which my telescope pointed. Upon his arrival to learn what I had made out, I told him the nest was forty or fifty yards in front of my telescope. We fixed one of our guns pointing in the same direction, so that we could easily see it. We then skirted the intervening bog, got our exact bearings from the gun, and commenced a search. In less than a minute we found the nest with four eggs. As before, it was in a depression on a ridge between two little lakes of black bog. In returning to our boat we crossed a higher part of the tundra near the river-bank and saw some Golden Plover. The eggs in this, our fifth nest, were considerably incubated, which was probably the reason why the birds showed more anxiety to lure us away.

The following day we crossed over again to the tundra, and spent several hours watching some Buffon's and Richardson's Skuas. We watched one of the latter birds to her nest, with two eggs, and then turned our attention to the Grey-Plover ground. We found one of our men trying to watch one of these birds to the nest. We lay down, one fifty yards to his right, and the other as much to his left. The birds behaved exactly as those we watched the day before. After the female had crossed and recrossed one hillock many times, and finally disappeared behind it, I made up my mind that the nest was there, and rose. My sudden appearance alarmed the male, who flew up, showing his black axillaries very distinctly in the evening sunshine as he skimmed over my head. We then all three rose, and in less than a minute met at the nest, which contained three eggs. I sat down to pack the eggs; and Harvie-Brown followed the male, who came up as we found the nest. Whilst I was packing the eggs and warming my hands, and talking pigeon-Russ with the man, the female came within range, and I took up my gun and shot her.

Our seventh and eighth nests of the Grey Plover we took on the 9th of July. We set sail at noon, with a north-east wind, to visit the tundra eight or ten versts higher up the great river. For some distance before we landed the coast was very flat, with willows down to the water's edge. Amongst these dwarf trees we repeatedly heard the Petchora Pipit (*Anthus gustavi*) and the Siberian Chiffchaff (*Phylloscopus tristis*). As soon as we got beyond the willows we landed on the tundra, and started in pursuit of a large flock of Buffon's Skuas, but were soon stopped by a pair of Grey Plovers, which showed by their actions that we were near the nest. We lay down as before, forty or fifty yards apart, and watched the birds. They ran about, up and down and all round us; and at the end of half an hour we were no wiser than at first. There was evidently something wrong. Harvie-Brown then shouted to me, "Have you marked the nest?"

I replied by walking up to him and comparing notes. We then watched together for another half-hour with exactly the same result. I suggested that we must be so near the nest that the bird dare not come on, and advised that we should retreat to the next ridge, which we accordingly did. We had not done so many minutes before the female made her way to the ridge where we had been lying. She then ran along the top of the ridge, passed the place where we had been stationed, and came down the ridge to the flat bog towards where we then were. I whispered, "She is actually crossing over to us." Suddenly she stopped, lifted her wings and settled down on the ground. We both whispered, almost in the same breath, "She is on the nest." I added, "I saw her lift her wings as she settled on the eggs." Harvie-Brown replied, "So did I," and added, "I can't hold out any longer against the mosquitoes." I replied, "I am perfectly satisfied; she is within range, take her." He lifted his gun to his shoulder. She ran off the nest to the top of the ridge and stood there until he tumbled her over. We then walked up to the nest, the first we had seen on the flat. The eggs were quite fresh, or nearly so; and the nest must have been made nearly a fortnight later than those we had previously taken. During that time the bogs had become much drier, so that we could cross them without much difficulty; and this was probably the reason why this nest was placed lower down. The eggs had all the appearance of a second laying, being less blotched than usual, one of them remarkably so. It is worth noticing that whilst we were watching in our first position, very near the nest, the birds were almost quite silent, and did not call to each other as they usually do.

After carefully packing the eggs, we walked on, and speedily started another pair. This time we lay down together, as near as we could tell, on the spot from which the birds rose, which seems to be generally from forty to fifty yards from the nest. The clouds of mosquitoes formed such a mist on the tundra that we had some difficulty in marking our birds; but by raking the horizon with a binocular, and getting well stung through our veils in the process, we soon found the female, and watched her to a ridge just opposite to us. She soon settled; and within a quarter of an hour after we had lain down we were both perfectly satisfied that she was on the nest. We gave her a few minutes' grace, and then walked up to the nest, without making any effort to shoot the bird, having perfectly identified her, and being almost tired out by the mosquitoes. The eggs in this nest were considerably incubated. The nest was placed, as before, in a hollow on a ridge. The ground on this ridge was not so mossy as usual, and there was much bare brown turf to be seen. Whether this had any thing to do with the colour of the eggs it is difficult to say; but the fact is that these eggs are quite brown in ground-colour.

Our ninth nest of the Grey Plover we took on the 12th of July. A stiff warm gale from the east, with occasionally a smart shower of rain, kept the air clear of mosquitoes in the morning. In the afternoon the wind fell, and the mosquitoes were as bad as ever; but we were too busy to heed them much. At eleven we crossed to the tundra. We soon came upon a pair of Grey Plovers, which rose a couple of hundred yards ahead of us, their wings glittering in a gleam of sunshine after a smart shower. These birds have frequently a very curious flight as they rise from the nest, tossing their wings up in the air, reminding one somewhat of the actions of a Tumbler Pigeon. We lay down, as near as we could tell, close to the spot from which they rose, and were somewhat puzzled at their behaviour. The male seemed to be as anxious as, if not more so than, the female, running about as much as she did, continually crying, and often coming very near us, and trying to attract our attention by pretending to be lame. The female rarely uttered a note. We supposed this must have been because one of us was too near the nest. Harvie-Brown moved his post of observation after we had spent some time without being able to discover any thing; and then the female behaved as usual, and I soon marked the position of the nest. We walked straight up to it, and found the four eggs chipped ready for hatching. We had no difficulty in shooting both birds, and afterwards hatched out two of the eggs, obtaining a couple of good specimens of young in down.

With a little practice this mode of finding birds' nests becomes almost a certainty. One has first to be quite sure which is the male and which the female. When the birds are near enough, and one can compare them together, the greater blackness of the breast of the male is sufficient to distinguish him; but we found that the females varied considerably in this respect, and that it was better to notice the habits of the birds. The female generally comes first to the nest, but she comes less conspicuously. She generally makes her appearance at a considerable distance, on some ridge of mossy land. When she has looked round, she runs quickly to the next ridge and looks round again, generally calling to the male with a single note. The male seldom replies; but when he does so it is generally with a double note. When the female has stopped and looked round many times, then the male thinks it worth while to move; but more often than not he joins the female by flying up to her. The female very seldom takes wing. She is very cautious, and, if she is not satisfied that all is safe, will pass and repass the nest several times before she finally settles upon it. The female rarely remains upon one post of observation long; but the male often remains for ten minutes or more upon one tussock of a ridge, watching the movements of the female.

We walked some distance before we came upon a second pair; but at length we heard the well-known cry, and got into position. We spent

nearly two hours over this nest, and were quite at sea at the end of the time. We changed our position several times, but to no purpose. The female went here and there and everywhere, as much as to say, "I'm not going on the nest as long as you are so near." At last the mosquitoes fairly tired us out, and we gave up the watching game and commenced a search. At last we found out the secret of the bird's behaviour. We picked up some broken egg-shells, and concluded at once that the bird had young. We tried to find them, but in vain. These two hours, however, were not wasted. The birds came nearer to me than they had ever done before. I often watched them at a distance of not more than ten yards, and was able to hear their notes more distinctly. The note most frequently used is a single plaintive whistle, *köp*, long drawn out, the *ö* pronounced as in German, and the consonants scarcely sounded. This I am almost sure is the alarm-note; it is principally uttered by the female when she stops and looks round and sees something of which she disapproves. If the male shows any anxiety about the nest, which he seems to do more and more as incubation progresses, he also utters the same note. The double note, *kl-ee* or *kleep*, the *kl* dwelt upon so as to make it a separate syllable, is also uttered by both birds. It is evidently their call-note. I have seen the female, when she has been running away from the male, turn sharp round and look towards him when he has uttered this note, exactly as any one might do who heard his name called. Whilst we were watching this pair of birds a couple of other Grey Plovers came up and called as they flew past. The male answered the call and flew towards them. On the wing this whistle is lengthened out to three notes. I had some difficulty in catching this note exactly. It is not so often uttered as the two others I have mentioned, and is generally heard when you least expect it; but I am almost sure it is a combination of the alarm-note with the call-note—*kl-ee-köp*. If I wanted to make a free translation from Ploverski into English, I should say that *kl-ee* means "Halloo! old fellow," and *köp* means "Mind what you are about."

We procured our tenth nest of the Grey Plover the same afternoon. It was found by our Samoyede, who brought us three eggs and the male and female shot at the nest. He accidentally broke the fourth egg. As it contained a live young bird, we placed these three eggs in our hatching-basket, where we had made a snug nest of Bean-Goose-down.

By this time we were pretty well tired with tramping the tundra. The ceaseless persecution of the mosquitoes, and the stifling feeling caused by having to wear a veil with the thermometer above summer heat, had taxed our powers of endurance almost to the utmost; and we turned our faces resolutely towards our boat; but a most anxious pair of Grey Plovers were too great an attraction for us to resist. We watched them for some time, during which a pair of Ringed Plovers persisted in

obtruding themselves impertinently between us and the objects of our attention. This pair of Grey Plovers also puzzled us, and we concluded that they possibly had young, and consequently we gave up the search. We had each marked a place where we thought the nest might be; and each of us went to satisfy ourselves that it was not there. The two places were about fifty yards apart. The birds first went up to Harvie-Brown and tried to attract him away by flying about and feigning lameness; then they came to me and did the same. They were so demonstrative that I felt perfectly certain of finding the nest, and shot at the female. She dropped in the middle of a wet bog. I then shot the male, walked up to him, and left him with my basket and gun whilst I struggled through the bog to pick up the female. Before I got up to her, I saw her lying on the turf on her breast with her wings slightly expanded. I was just preparing to pick her up, when she rose and flew away, apparently unhurt. I must have missed her altogether, as she was evidently only shamming to draw me away. I returned to search for the nest, and was unable to find it. Whilst I was looking for it Harvie-Brown came up, and I gave up the search, and we again turned towards the boat. When we had got about halfway towards the spot where Harvie-Brown had been looking, I caught sight of a young Grey Plover in down, almost at my feet. Stooping down to pick it up, I saw the nest with three eggs not a yard from me. This was the last and eleventh nest of these rare birds which we found. The young in down are very yellow, speckled with black, and are admirably adapted for concealment upon the yellow-green moss on the edges of the little bogs close to which the Grey Plover seems always to choose a place for its nest.

Our attempt to hatch the highly incubated eggs, and thus obtain specimens of young in down, was successful. We soon had five young Grey Plovers well and hearty, and saved three or four more afterwards. We subsequently spent a week at Dvoinik, a hundred miles lower down the Petchora, on the shores of the lagoon. Here we found the Grey Plover even more abundant than on the tundra opposite Alexievka. It frequented exactly the same description of ground. Our interpreter shot a Grey Plover from the nest, and brought us four young in down from it, evidently just hatched. This was on the 22nd of July; and two days later I caught a young Grey Plover in down, somewhat older and greyer in colour.

The eggs of the Grey Plover are four in number, intermediate in colour between those of the Golden Plover and the Lapwing, and subject to variation, some being much browner, and others more olive, none quite as olive as typical Lapwing's eggs or as buff as typical ones of the Golden Plover, but the blotching is in every respect the same; the underlying spots are equally indistinct, the surface-spots are generally large, especially

at the large end, but occasionally very small and scattered, and sometimes taking the form of thin streaks. They vary in length from 2·2 to 1·9 inch, and in breadth from 1·4 to 1·35 inch. Only one brood is reared in the year.

The adult male Grey Plover in breeding-plumage has the general colour of the upper parts, including the tail, white, barred with black and brown; the quills are very dark brown, with a white wedge-shaped pattern on the inner web, and more or less extended shaft-streaks, especially on the last primaries; the forehead, a stripe over the eye, the sides of the neck, and the upper tail-coverts are nearly white. The lores, ear-coverts, and axillaries are black, as are also the rest of the underparts, except the under wing-coverts, thighs, vent, and under tail-coverts, which are white. Bill, legs, feet, and claws black; irides dark hazel. The female is not quite so handsome a bird, the white parts are clouded and mottled with brown, the black on the underparts is duller and mixed with white, and brown instead of black is the predominant colour of the bars on the back. After the autumn moult the upper parts of the male are brown narrowly barred with white, whilst the underparts are white streaked on the sides of the neck and breast and on the flanks with brown. In the female the white bars on the head and back are reduced to obscure pale ends to the feathers, and the streaks on the underparts are more abundant and less clearly defined. Young in first plumage very closely resemble the winter plumage of adults on the underparts, except that the white is slightly suffused with buff, and the streaks are larger and more conspicuous. The colours of the upper parts are, however, very different to those of adults: the ground-colour is a uniform dark brown, which, instead of being barred with white, is spotted with yellow. These yellow spots fade into white during the winter, few feathers being apparently moulted, but in spring the feathers appear to be moulted into nearly adult plumage.

In this species it seems that the young retain most of their first feathers until their first spring moult, when they acquire a plumage so nearly resembling that of the adult as to be scarcely distinguishable from it. Young in down are deep yellow above, spotted and blotched with black, and are nearly white underneath. They are scarcely distinguishable from young in down of the Golden Plover or the Asiatic Golden Plover. At all ages and in all plumages the Grey Plover may be distinguished from its allies by having black axillaries and a small hind toe.

Genus VANELLUS.

Curiously enough, the Lapwings were included by Linnæus in his genus *Tringa*; but in 1803 Bechstein ('Ornithologisches Taschenbuch,' ii. p. 313) adopted the genus *Vanellus*, which Brisson had established for their reception in 1760 in his 'Ornithologia,' v. p. 94. The Common Lapwing, the *Tringa vanellus* of Linnæus and the *Vanellus vanellus* of Brisson, is the type.

The Lapwings belong to the group of genera in this family in which the front of the tarsus, and sometimes the back also, is scutellated, or covered with broad transverse plates, instead of being reticulated or covered with small hexagonal scales. They are distinguished from the other genera of this family, in which the tarsus is scutellated in front, by the peculiar shape of the bill, which is the same as that in the genus *Charadrius*. From the species in the latter genus, some of which have the tarsus scutellated, they may be distinguished by their rounded wings, the first, second, third, and fourth primaries being nearly equal in length. Some species have a hind toe, but in others it is absent; some have a spur on the carpal joint, some a rudimentary knob only, and others no trace of one; some have crests on their heads, and others only indications of one, whilst wattles, in some species developed to an extraordinary extent, in others very slightly, are often present.

There are about thirty species in this genus, which are distributed throughout the world, except in the Arctic regions, in North America, and in New Zealand.

The Lapwings do not differ much in their habits from the Plovers. They chiefly frequent, during the breeding-season, inland moors, marshy commons, fallows, and pastures, retiring at the approach of winter to maritime districts. Their flight is slow, but graceful and often very erratic; and their notes are loud, many of them being very melancholy in tone. Their food, for much of which they search in the twilight, is composed of worms, mollusks, insects, &c. Their nests are very slight, mere depressions in the ground lined with a few scraps of herbage; and their eggs, four in number, do not differ from those of the Plovers.

VANELLUS CRISTATUS *.

LAPWING.

(Plate 27.)

Vanellus vanellus, *Briss. Orn.* v. p. 94, pl. viii. fig. 1 (1760).
Tringa vanellus, *Linn. Syst. Nat.* i. p. 248 (1766).
Vanellus capella, *Schaeff. Mus. Orn.* p. 49 (1789).
Vanellus vulgaris, *Bechst. Orn. Taschenb.* ii. p. 313 (1803).
Vanellus cristatus, *Wolf et Meyer, Vög. Deutschl.* ii. p. 110 (1805); **et auctorum plurimorum**—*Naumann, Gould, Gray, Schlegel, Heuglin, Rüppell, Tristram, Swinhoe, Godman, Jerdon, Brehm, Reinhardt, Bolle, Cabanis, Finsch, Nordmann, Salvadori, Baird, Dybowsky, Taczanowsky, Goebel, Homeyer, Fritsch, Savi, Radde, Schrenck, Shelley, Saunders*, &c.
Vanellus gavia, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 29 (1816).
Charadrius gavia (*Leach*), *Licht. Verz. Doubl.* p. 70 (1823).
Charadrius vanellus (*Briss.*), *Pall. Zoogr. Rosso-Asiat.* ii. p. 132 (1826).

The Lapwing or Peewit is the commonest and best known of the Plovers found in the British Islands. It is generally distributed throughout Great Britain and Ireland, breeding in every county, and its range extending to the outlying islands as far north as the Shetlands, as far west as the Hebrides, and as far south as the Channel Islands, in which latter district, however, it only appears as a winter visitor. It is more abundant in the southern portion of our islands in winter, its numbers being increased at that season by arrivals from the continent and from Scotland.

The Lapwing is a semi-arctic species, ranging during the breeding-season from the Atlantic to the Pacific, in Scandinavia up to the Arctic circle, but in Siberia not further north than latitude 55°. It is a rare straggler to Greenland, but is more common in summer in Iceland and the Faroes. In Central Europe south of the Baltic and in the British Islands it is a resident. South of Siberia it is a summer visitor to Turkestan, Mongolia, and the north island of Japan. It winters in the south island of Japan, China, North India, Persia, Asia Minor, the basin of the Mediterranean, the Canaries, Madeira, and the Azores. A few remain to breed in South-western Europe. In Africa it has not been known to occur south of the Desert, but a few remain to breed on the southern shores of the Mediterranean. The Lapwing has no very near ally.

* It is much to be regretted that Saunders should have followed the 'Ibis List' in the attempt to rob the Lapwing of the name by which it is universally known. They have only succeeded in complicating the synonymy of this species, as under no circumstances can the name which they have used be the correct one. Those ornithologists who wish to carry out the rules of the Stricklandian Code regardless of consequences must use the name *Vanellus capella*, a long-forgotten name which my good friend Dr. Stejneger has attempted, let us hope unsuccessfully, to rescue from oblivion.

The Lapwing frequents wild uncultivated districts, moors and the rough pastures near them, unenclosed lands, large pastures and open fallows, commons and heaths. It shows a preference for swampy places; but water is by no means essential to it. A favourite haunt of the Lapwing is on a grassy part of the moor where the ground is studded with rushes, rough and broken up into small mounds and covered with all kinds of weeds. The Lapwing is a shy and wary bird, and takes wing the moment it is alarmed, seldom allowing the observer to approach it very closely unless it has got young, when its anxiety for their welfare overcomes its natural timidity. On the open commons or the wild lonely moors the birds rise here and there from the herbage and fly anxiously about an intruder's head. The flight of this bird is very erratic and peculiar. Its wings are very long and broad and it flaps them in a regular, sedate manner. Now it soars upwards for a few yards, seemingly without effort, then flapping its broad rounded wings it wheels round and round; then it darts rapidly down as if hurling itself to the ground; and then mounting the air again with easy grace flies in ever-changing course, darting, wheeling, tumbling, and reeling, as though beating time with its pinions to its wailing and expressive cries. As the alarm subsides, the birds gradually settle again, keeping their wings expanded for a few moments after they have alighted and then gracefully folding them. Upon the ground the Lapwing is a very stately graceful bird, walking slowly about, or with quick steps bounding forward to catch an insect or seize a tempting worm. At all seasons of the year the Lapwing is more or less gregarious, and in some districts its colonies are very large. When flying from place to place the Lapwings form into a scattered irregular flock, never taking any definite shape, as is done by so many of the other Waders. When feeding, one or two sentinels seem ever on the watch to convey to the rest the signal of approaching danger.

The Lapwing becomes particularly clamorous at night, and obtains much of its food in the dusk of the evening. At all hours its wild expressive call may be heard, as it floats on ever-moving pinions above its favourite haunts. Its common note resembles the syllables *pee-weet*, or *weet-a-weet, pee-weet-weet*, from which is derived one of its best-known names. This note is modulated in various ways, especially by the male in the breeding-season. The food of the Lapwing is largely composed of worms, snails, insects, and grubs in summer; but in winter, especially when hard pressed, it retires to the shore, where it picks up various small marine animals, &c. It also eats small seeds and even tender shoots of herbage. When feeding, it sometimes associates with other birds, such as Rooks, Starlings, Gulls, or other Plovers, but when disturbed the Lapwings generally fly off by themselves.

Very early in spring the Lapwings leave their winter-quarters and return

to their breeding-grounds. Great numbers of birds often breed in close proximity, but never in what might be termed a colony. By the beginning of April the birds search out a nesting-site, and eggs may be obtained throughout that and the following month. The birds in some districts are earlier than those in others. The site for the nest is often under the shelter of a tuft of rushes or other herbage, often on the summit of a mole-hill, and very frequently on the bare fallow or turf in any little depression that may chance to be there. The footprint of a cow or a horse is very frequently selected. Where no hole is to hand the birds scratch a little hollow, which is scantily lined with a few bents, sprays of withered heath, or bits of dead rush, moss, or dry grass, on which the eggs are laid.

The eggs are usually four in number, but the bird has been known to sit on two or three, probably in cases where the first clutch have been destroyed; and in very rare instances as many as five have been found. Mr. H. A. Macpherson writes to inform me of a clutch of the latter number which came under his observation. They are buffish brown, light buff, or olive, and in rare instances pale green in ground-colour, heavily blotched and spotted with blackish brown, and with underlying markings of inky grey. The eggs of this bird are subject to much variation. On some the markings are small and evenly distributed over the entire surface; on others the blotches are large and confluent, hiding most of the ground-colour. Some are very sparingly marked; others have most of the spots or blotches in a broad zone round the large end. They are very large for the size of the bird, varying in length from 2·0 to 1·75 inch, and in breadth from 1·4 to 1·28 inch. The eggs of the Lapwing may be easily distinguished from those of the Golden Plover by their much browner appearance and, on an average, smaller size. They vary considerably in shape, some examples being very elongated, whilst others are much rounder. If the first clutch be removed, others will be laid; but otherwise the Lapwing probably only rears one brood in the year.

When the breeding-place of the Lapwing is intruded upon, the old bird glides stealthily off the nest, runs a little distance, then rises in the air to flutter restlessly above the intruder's head, uttering its harsh wailing cries. So closely do the eggs resemble surrounding objects in colour that it is no easy task to find them; but the old birds very often betray their whereabouts by hovering above them: at these times the birds are easily approached, often coming within a few feet. When the young are hatched they soon follow their parents in search of food. If menaced by danger the old birds quit their offspring at once, fly into the air, or reel and tumble along the ground as if wounded, while the little downy nestlings scurry off in different directions and hide themselves amongst the herbage. So closely does the colour of their down harmonize with the

colours around that it is next to impossible to find them, as they crouch as if dead in any available nook.

The eggs of the Lapwing are highly prized as articles of food, and a regular and extensive trade is done in them. Thousands find their way to the London markets in the season, and fetch from four to ten shillings a dozen, according to the abundance of the supply. In the early part of the season much higher prices have been asked. Great numbers of these eggs are imported from the continent, and a large supply is obtained in the marshy districts of the eastern counties, where the Lapwing is one of the commonest of birds.

As the season advances the Lapwing congregates into large flocks, the young and their parents from one breeding-station join those of another, and at the approach of winter quit their upland haunts and repair to lower grounds, especially those in the neighbourhood of the coast. In autumn flights of continental Lapwings arrive on the eastern coasts, accompanying the Plovers from the north. During winter the Lapwings are constantly changing their ground, and often move before a storm, flying in broad scattered flocks to more favourable districts, returning again when the weather is more settled. Numbers of these birds are often netted in the marshes or shot: but as articles of food they are much inferior to the Golden Plover. Even when in prime condition the flesh is dark and often accompanied by an unpleasant odour, which renders it far from palatable.

The male Lapwing in breeding-plumage has the general colour of the upper parts metallic green, shading into reddish purple on the scapulars, and into purplish green on the wing-coverts; the head and neck behind and below the eye are nearly white; the head in front of the eye and extending downwards to the breast, and upwards to the crown, which ends in a long crest, is black, with purple and green metallic reflections; but there are always some white feathers on the lores, the adjoining ear-coverts, and above the eye. The underparts below the breast, axillaries, under secondary coverts, the basal half of the secondaries, and the outer tail-feather on each side and the basal half of the others are white; the under tail-coverts are buff, and the upper ones are chestnut; the primaries, under primary-coverts, terminal half of secondaries and of the tail-feathers are black; the three first primaries have broad patches of buffish white near the tips; and the tail is narrowly tipped with buffish white. Bill black; legs and feet fleshy red, claws black; irides dark hazel. The female has less metallic gloss on the feathers, but otherwise scarcely differs from the male except in having a shorter crest, and in having the chin and throat marked with white *. After the autumn moult nearly all the black dis-

* Some ornithologists, as Macgillivray, Gould, and Saunders, state that the sexes of the Lapwing do not differ in colour; whilst others, as Jardine, Naumann, and Dresser, repre-

appears from the chin and throat; and the lores and the eye-stripes are more distinct. Young in first plumage have buff tips to most of the feathers, some of which are retained in birds of the year. Young in down are pale reddish brown on the upper parts spotted and blotched with black, and are white on the underparts, with a dark band across the breast.

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sent the female as differing but slightly from the male in winter plumage. The truth probably lies between these two statements, the white on the throat of young females being very conspicuous in breeding-plumage, whilst it almost disappears at that season in very old birds.

EGGS AND YOUNG OF GREY PLOVER.

Genus CURSORIUS.

The Coursers were placed by Gerini in the genus *Pluvialis*, and afterwards by Latham in the genus *Charadrius*; but the latter author in 1790, in his 'Index Ornithologicus,' ii. p. 751, established the genus *Cursorius* for their reception. The Cream-coloured Courser, *C. gallicus*, the species first mentioned by Latham, has by common consent been accepted as the type.

The Coursers have the tarsus scutellated both in front and at the back, but they have no hind toe. They might be included in the genus *Vanellus*, but are distinguishable by the difference in the form of the bill, which resembles closely that of *Pratincola*. The line of the gape and the profile of the under mandible are much curved downwards.

Ten species belonging to this genus are known, and are confined to the tropical portions of the Old World. One of these is an accidental visitor to Europe and the British Islands.

The Coursers frequent dry arid plains and sandy deserts almost bare of vegetation. They are sociable birds, and are generally met with in small parties. They run quickly, and take wing with reluctance, depending more on the protective colour of their plumage for safety. Their food is principally composed of insects of different kinds. Their notes are harsh and unmusical. They make no nest, depositing their two or three eggs in a small hollow in the ground.

CURSORIUS GALLICUS.

CREAM-COLOURED COURSER.

(Plate 20.)

Pluvialis morinellus flavescens, *Gerini, Orn. Meth. Dig.* iv. p. 69, pl. 474 (1773).
Charadrius cursor, *Lath. Gen. Syn. Suppl.* i. p. 293 (1787).
Charadrius gallicus, *Gmel. Syst. Nat.* i. p. 692 (1788); **et auctorum plurimorum**— (*Schlegel*), (*Degland & Gerbe*), (*Bonaparte*), (*Heuglin*), (*Salvin*), (*Tristram*), (*Blyth*), (*Dresser*), (*Saunders*), &c.
Cursorius europæus, *Lath. Ind. Orn.* ii. p. 751 (1790).
Charadrius corrira, *Bonnat. Tabl. Encycl.* p. 23 (1790).
Cursorius isabellinus, *Meyer, Taschenb.* ii. p. 328 (1810).
Tachydromus gallicus (*Gmel.*), *Illig. Prodr.* p. 250 (1811).
Tachydromus europæus (*Lath.*), *Vieill. N. Dict. d'Hist. Nat.* viii. p. 293 (1817).
Cursor isabellinus (*Meyer*), *Wagler, Syst. Av., gen.* Cursor (1827).
Cursorius gallicus (*Gmel.*), *Bonap. Faun. Ital., Ucc. Introd.* (1832).
Cursor europæus (*Lath.*), *Naum. Vög. Deutschl.* vii. p. 77 (1834).
Tachydromus isabellinus (*Meyer*), *Nitzsch, Syst. Pterylogr.* p. 201 (1840).
Cursorius jamesoni, *Jerd. B. India*, ii. p. 875 (1863).

The Cream-coloured Courser was first introduced to ornithologists by Gerini, whose plate is an excellent representation of the bird. It was afterwards figured in the 'Planches Enluminées,' from an example shot in France. In 1788 Gmelin called it *Charadrius gallicus*, being apparently unaware that Latham had already given it the name of *Charadrius cursor* in the previous year. Latham, however, took his revenge two years later by elevating his own specific name into a new generic one, and ignoring the specific name given to it by Gmelin, having in the meantime discovered that Gerini had already figured the bird eight years before the date of Buffon's description, and that it was by no means confined to France. The number of occurrences of this bird in the British Islands is very remarkable; they may be briefly summarized as follows:—

1785, Autumn. Wingham, East Kent (Lath. Gen. Syn. Suppl. i. p. 293).
1793. North Wales (Montagu, Orn. Dict. Suppl.).
1816, April. Wetherby, Yorkshire (Atkinson, Comp. Brit. Orn. p. 165).
1825. Harewood Park, Yorkshire (Gould, B. Great Brit. iv. pl. 44).
1827, October 15th. Charnwood Forest, Leicestershire (Fox, Zool. Journ. iii. p. 492).
1828, October 3rd. Aldborough, Suffolk (Acton, Mag. Nat. Hist. iv. p. 163).
1828. Holme, near Market Weighton (Clarke, Handb. Vert. Fauna Yorksh. p. 70).

1840. Marsh Capel, Lincolnshire (Saunders's ed. Yarr. Brit. B. iii. p. 240).
1846, November 9th. Cheswick, Northumberland (Harting, Handbook Brit. B. p. 132).
1847, Autumn. Blakeney, Norfolk (Stevenson, B. of Norfolk, ii. p. 49).
1853, Hunting-season. Batcombe Hill, Dorset (Mansell-Pleydell, B. of Dorset, p. 25).
1855, Autumn. Nestaere, Norfolk (Stevenson, B. of Norfolk, ii. p. 49).
1855, October 2nd. Salisbury Plain (Gardener, 'Zoologist,' 1855, p. 4913).
1856, October. Braunton Burrows, North Devon (M. A. Matthews, 'Zoologist,' 1857, p. 5346). Two seen, one shot.
1858, October 19th. Hackney Marshes, Middlesex (Newman, 'Zoologist,' 1858, p. 6309).
1860, March. Braunton Burrows, North Devon (G. F. Mathew, 'Zoologist,' 1860, p. 6980). Two seen.
1860, Autumn. Saint Michaels-on-Wyre, Lancashire (Saunders's ed. Yarr. Brit. B. iii. p. 241).
1864, October. Maryport, Cumberland (Allis, 'Zoologist,' 1865, p. 9418).
1866, October. Sandwich, Kent (Harding, 'Zoologist,' 1866, p. 523).
1868, October 8th. Lanark, Scotland (Walker, 'Zoologist,' 1868, p. 1459).
1870, November. Goswick, Northumberland (Gurney, 'Zoologist,' 1871, pp. 2522, 2562).

The Cream-coloured Courser is only an accidental visitor to Europe. It breeds in the Canary Islands, the whole of North Africa, Arabia, Persia, Baluchistan, the Punjaub, Scind, and Rajputana. In Europe it has occurred once in Holland, several times in Germany, and more often in France, Spain, and Italy. It is said to be an occasional straggler into South Russia from the Trans-Caucasian steppes, which are apparently the northern limit of its breeding-range; and Canon Tristram met with it on the coast of Palestine, where it may possibly breed. The Cream-coloured Courser may almost be regarded as a resident bird, but there is said to be a partial migration southwards in autumn.

The Cream-coloured Courser has no very near ally. In India it is represented by *Cursorius coromandelicus*, in West Africa by *C. senegalensis*, and in South Africa by *C. burchelli*, all of which are tropical forms easily distinguished at a glance by having the colour of the lower breast dark chestnut.

It is very difficult to account for the great number of occurrences of the Cream-coloured Courser in the British Islands. The fact that nearly all the specimens obtained have been shot in autumn looks like an arrival of

migratory birds from the east, though it must not be forgotten that the chances of a bird being shot during the first two months of Partridge-shooting in this country are greater than at any other time of the year. This species is seldom or never kept in confinement; and it is not likely that escaped birds would be so exclusively obtained in autumn. The more probable explanation is that, in the Caucasus, this species is exclusively a migratory bird, and that the birds which visit our islands in autumn, most of which appear to be birds of the year, have accidentally wandered out of the usual track; or it does not seem impossible that they may be individuals driven from the Canary Islands by south-westerly gales.

The Cream-coloured Courser is a bird of the desert. It lives on the arid sand-plains or on the bare elevated plateaux, where scarce a tuft of scanty herbage or a bush is to be found. It loves to frequent the bases of sand-hills, and is sometimes seen in the miserable desert pastures or amongst the sand-dunes on the outskirts of the oases. In these dismal uninteresting regions the Courser trips about in pairs, or less frequently in little parties. If it is not exactly a shy bird it appears to be a very wary one, and runs quickly off to conceal itself as the traveller approaches. It prefers to run like lightning over the sand rather than to take wing, every now and then pausing for a moment to look warily around, to see if it is still pursued. When alarmed it often runs off and conceals itself either by squatting close to the sand, or hiding under a stone or tuft of herbage, where its sand-coloured plumage effectually conceals it from view. It generally runs a little distance before taking wing, and seldom seems to fly very high. If a flock be observed they are usually seen scattered up and down the sandy tract, not feeding close together. When danger threatens each looks out for itself, taking refuge in the nearest available cover, or crouching flat down on the sand. Favier described the note of a Cream-coloured Courser which he kept in captivity as *rererer*; he also says that their alarm-note is like that of a Plover.

The food of the Cream-coloured Courser is principally composed of insects and grubs. It seems to be especially fond of grasshoppers, and doubtless eats small locusts. Birds which Favier kept in confinement were fed on grasshoppers and the larvæ of Coleoptera.

In North-west Africa the breeding-season of the Cream-coloured Courser is in May and June; in Egypt, according to Heuglin, it is much earlier, being in March and April; whilst in the Punjaub Hume says that the laying-season is chiefly in July, but that eggs have been obtained from March to August, according to the state of the rains. But meagre details have been published respecting the breeding-habits of this bird, and few are made from personal observation. It is said to deposit its eggs on the bare ground, generally choosing a little hollow, or scratching one out for

itself. In the Punjaub the nest is sometimes amongst stubble, under a bush or near a clump of grass, or amongst jungle or on waste ground. The eggs are sometimes two, more often three in number, never more. The first eggs that were apparently known of this bird were laid in confinement, and from one solitary female the cabinets of most European egg-collectors have been enriched. This valuable bird was in the possession of Favier. In 1853 she laid eight eggs, the first on the 15th of May, and the others at intervals up to the 25th of June. In 1854 she laid twelve eggs, the first on the 17th of May and the last on the 28th of July. None were laid in the following year, but in 1856 two eggs were laid on the 6th and 7th of July. In 1857 ten more eggs were laid from May to July, but in 1858 none were produced. In 1859 she produced four more between the 6th of July and the 10th of August. One of these eggs, which I have figured, is in my collection; it is pale ochraceous buff in ground-colour, thickly spotted, blotched, and freckled with buffish brown, and with numerous underlying markings of grey, which give it a very marbled appearance. Eggs from the Punjaub obtained by Hume are smaller and on an average darker than those from North Africa; they vary in length from 1·4 to 1·1 inch, and in breadth from 1·1 to 0·9 inch. The eggs of no British bird can easily be mistaken for that of the Cream-coloured Courser. Hume describes the nest as a small hollow from three to five inches in diameter, and at most two inches in depth; sometimes it is lined with a little dry grass, which may have lodged there accidentally. At the nest this bird appears to be very tame. It is not known whether more than one brood is reared in the year, or whether both birds assist in the duties of incubation. After the breeding-season is over the birds seem to become more gregarious, and often wander far from their summer-quarters during the winter, wandering over the deserts and sand-plains like nomads.

The general colour of the plumage of the Cream-coloured Courser is sandy buff or isabelline colour, somewhat paler on the underparts, shading into white on the under tail-coverts, and into lavender on the hind head. A white streak passes from the lores, over each eye, to the nape, which is black; below this white streak another black line passes from behind the eye to the hind neck. The primaries, axillaries, and under wing-coverts are nearly black; the secondaries are dark brown, with buff outer webs and white tips; the tail-feathers, except the two centre ones, are tipped with white and barred subterminally with black. Bill black, paler at the base of the lower mandible; legs and feet buff, claws brown; irides hazel. The female does not differ from the male in colour. It is not known that winter plumage differs from that of summer. Young in first plumage are without the black markings on the hind head, and most of the feathers, both of the upper and under parts, have dark subterminal margins. Young in down appear to be unknown.

The Andalusian Hemipode, *Turnix andalusica**, has been included in the British list by several ornithologists. Two examples are said to have been shot by a gamekeeper near Chipping Norton, in Oxfordshire, one on the 29th of October 1844, and the other shortly afterwards (Goatley, Ann. Nat. Hist. xiv. 1845, p. 459; and Newman, 'Zoologist,' 1845, p. 872). A third example is said to have been bought of two Irishmen on the 7th of April 1865, one of whom caught it alive, by the son of Mr. Mosley, a bird-stuffer of Huddersfield (Gould, Proc. Zool. Soc. 1866, p. 210).

This species is a resident in Southern Portugal, Southern Spain, Sicily, Morocco, Algeria, Tunis, and Tripoli, and is very unlikely to have visited this country. As this is a bird which is often kept in confinement, there cannot be much doubt that the specimens obtained in this country have escaped from an aviary. It is somewhat less than the Common Quail, to which it bears some resemblance in the style of its coloration, but may at once be distinguished by the absence of the hind toe. The egg of this bird cannot easily be confused with that of any other European bird; it differs from the eggs of the Game Birds in the important fact that it possesses two kinds of spots, none of the eggs of the latter birds ever having any pale grey underlying markings.

* TURNIX ANDALUSICA.

ANDALUSIAN HEMIPODE.

(Plate 20.)

Tetrao sylvaticus, *Desf. Mém. de l'Ac. Roy. des Sc.* 1787, p. 500, pl. xiii.

Tetrao gibraltaricus,
Tetrao andalusicus, } *Gmel. Syst. Nat.* i. p. 766 (1788).

Perdix gibraltarica (*Gmel.*),
Perdix andalusica (*Gmel.*), } *Lath. Ind. Orn.* ii. p. 656 (1790).

Turnix africanus,
Turnix gibraltarica (*Gmel.*),
Turnix andalusica (*Gmel.*), } *Bonnat. Tabl. Encycl. et Méth.* i. pp. 6, 7 (1790).

Ortygis gibraltaricus (*Gmel.*), *Illiger, Prodr.* p. 243 (1811).

Hemipodius tachydromus,
Hemipodius lunatus, } *Temm. Pig. et Gal.* iii. pp. 626, 629 (1815).

Ortygis andalusica (*Gmel.*), *Keys. u. Blas. Wirb. Eur.* p. lxvi (1840).

Turnix albigularis, *Malh. Faune Orn. de l'Alg.* p. 26 (1855).

Turnix sylvaticus (*Desf.*), *Bonap. Cat. Parzud.* p. 13 (1856).

Genus GLAREOLA.

The Pratincoles were most unaccountably placed by Linnæus in the genus *Hirundo*! though Brisson in 1760 placed them in their true position near the Plovers in his 'Ornithologia,' v. p. 141, establishing the genus *Glareola* for their reception; the Common Pratincole (*G. pratincola*), being the *Glareola glareola* of Brisson, is the type.

The Pratincoles have the tarsus scutellated both in front and at the back; the bill is somewhat similar in shape to that of the Plovers and Lapwings, but with the basal straight portion much shorter; and the hind toe is very small. They may readily be distinguished by the more or less forked tail.

Nine species of Pratincoles are known, which are distributed throughout the temperate and tropical portions of the Old World.

In many of their habits the Pratincoles show close affinity with the Plovers. Like those birds, they principally frequent sandy steppes, marshes, and the sides of lakes and rivers. They are gregarious and breed in colonies. They run and walk with ease, and their flight is rapid and well sustained. Their food consists largely of insects, which are often captured in the air, worms, &c. Their notes are harsh. They make little or no nest, depositing their two or three eggs in a slight depression in the ground.

GLAREOLA PRATINCOLA.

COMMON PRATINCOLE.

(Plate 24.)

Glareola glareola, Glareola torquata, Glareola nævia, *Briss. Orn.* v. p. 141 (1760, adult). p. 145 (1760, immature). p. 147 (1760, young).

Hirundo pratincola, *Linn. Syst. Nat.* i. p. 345 (1766); et **auctorum plurimorum**—(*Schlegel*), (*Gould*), (*Rüppell*), (*Finsch*), (*Gray*), (*Salvadori*), (*Shelley*), (*Saunders*), &c.

Trachelia pratincola (*Linn.*), *Scop. Ann. I. Hist. Nat.* p. 110 (1769).

Glareola austriaca, *Gmel. Syst. Nat.* i. p. 695 (1788).

Glareola pratincola (*Linn.*), *Leach, Trans. Linn. Soc.* xiii. p. 131, pl. xii. (1820).

Pratincola glareola (*Briss.*), *Degl. Orn. Eur.* ii. p. 107 (1843).

Glareola limbata, *Rüpp. Syst. Uebers.* p. 113, pl. 43 (1845).

In 1813 Graves, in his 'British Ornithology' (vol. ii.), recorded and figured the first example of the Pratincole which was obtained in the British Islands. He states that it was shot near Ormskirk in Lancashire in October 1809; but Bullock, into whose possession the specimen passed, writes (Trans. Linn. Soc. 1815, xi. p. 177) that it was in 1807 that it was obtained. Graves mentions three other examples, viz. one near Boldness in Cumberland in 1807, one near Truro in Cornwall in September 1811, and another on the Eude Waters on the Duke of Norfolk's estate in Surrey previous to 1813. Since this date about a score examples of the Pratincole have been obtained, principally in the south and east of England. Only one example has been recorded from Scotland, which was killed on Unst, one of the Shetland Islands, on the 16th of August, 1812 (Bullock, Trans. Linn. Soc. 1815, xi. p. 177). A single example has been recorded from Ireland, which was shot at Castlefreke in co. Cork in October, some years previous to 1843 (Harvey, 'Fauna of Cork,' p. 11). Nearly all of the occurrences have taken place in spring or autumn.

The Pratincole is a regular summer visitor to the basin of the Mediterranean, Spain, and the valley of the Lower Danube. North of these limits it is an accidental visitor to North France, Belgium, Holland, Germany, and Denmark. It winters in Africa south of the Sahara, and has been found in the west as far south as Damara Land, and in the east as far as Natal. Eastwards its range extends through the basin of the Black Sea and the Caucasian steppes to Turkestan, where it was obtained by Finsch as far east as Ala-Kul, Afghanistan, and the valley of the Indus. From this latter locality, westwards as far as the river Don, a nearly allied species,

G. melanoptera, also occurs, which differs in having the under surface of the wings black instead of chestnut. This bird passes through Constantinople and the valley of the Nile on migration, and winters throughout South Africa. The specific distinctness of this species is, however, very doubtful, as Severtzow says that he obtained intermediate forms in Turkestan.

In Mongolia, extending northwards into Eastern Dauria, China, and throughout the Oriental Region, as far west as Scind, and ranging south-eastwards through the islands of the Malay Archipelago into Australia, a nearly allied species, *G. orientalis*, occurs. This species is probably only a summer migrant to Mongolia, and only a winter visitor to the Malay Archipelago and Australia. It differs from the western species in having a much less forked tail, the outside feathers of which are only one inch instead of two inches longer than those in the centre; it also agrees with *G. melanoptera* in having no white tips to the secondaries.

The Pratincole is an inhabitant of sandy plains, large marshes, and bare elevated country. Sometimes it frequents more cultivated districts, flying over the cornfields and pastures in search of food; but its favourite haunts are on the sandy tracts either near the sea or on the tablelands of the interior. The Pratincole spends a considerable portion of its time in the air, hawking for insects like a gigantic Swallow, skimming along with graceful motion, wheeling and darting about, chasing its prey in all directions. Upon the ground it is equally at its ease, and runs to and fro with surprising swiftness, in spite of its short legs. Sometimes it even wades in the little pools with which its haunts often abound; frequently it flies at a considerable height, occasionally very low, just skimming along above the ground.

The food of the Pratincole consists exclusively of insects, many of which it catches on the wing, or snaps up as it runs along the ground. The insects most preferred appear to be beetles and grasshoppers. Much of its food is searched for in the evening. Its note is a peculiar rattle, impossible to express on paper; but the principal sound may be represented by *kr* rapidly repeated. When I was in the valley of the Danube in 1883 I had many opportunities of studying the habits of this bird. In some districts they abounded, especially on some newly-ploughed land near Lake Tuzla. They flew constantly over us uttering their rattling note, or perched on the ground, lifting and drooping their wings to attract our attention. We came to the conclusion that they were on the point of laying, and were probably under the mistaken impression that they had already begun to do so. The flight of this bird is very Swallow-like; they hawked over the reeds exactly like the Swallows, and turned with almost as much ease. Birds we shot had been feeding on beetles. There is no bird with which I am acquainted that so persistently and constantly

feigns lameness as the Pratincole. Before the breeding-season has fairly commenced you may stand on a piece of fallow ground and watch a dozen birds, each within pistol-shot, laying on their sides making apparently constant efforts to expand a wing, as if in the last death-struggle, and yet you may search in vain for an egg.

I found the Pratincole breeding in considerable numbers on the islands in the lagoons of Missolonghi in 1873, and in a precisely similar locality a little to the north of the entrance to the Gulf of Smyrna in 1872. In the former locality I found plenty of fresh eggs in the last week of May; and in the latter most of the eggs were almost ready to hatch in the second week of June. At Missolonghi the birds were wild, flying round us uttering their peculiar cry before we landed on the islands. In Asia Minor, on the other hand, they were evidently sitting hard, and allowed us to land and approach them before they left their nests. They then evidently attempted to lure us away from their treasures by feigning lameness, standing with drooping wings, or running along the ground as if unable to fly. When once upon the wing their flight was rapid and powerful, like that of a Tern. They are not, strictly speaking, gregarious in their habits. We never found anything like a colony of them upon any one island. We rarely visited any of the numerous islands without finding at least one pair of birds upon it, and perhaps none of the islands contained more than half a dozen pairs, and they were scattered about at a distance from one another. They do not make any nest, but lay their eggs upon the bare ground, seldom, if ever, taking the trouble to scratch a hollow or to collect what dry grass or seaweed may be at hand. They seem studiously to avoid coarse grass or rank herbage, and prefer to lay their eggs on the dried mud, sheltered only by the straggling plants of *Salsola*, which grow all over the lowest and wettest parts of the islands. The number of eggs was usually two, occasionally three, and only in one instance four; probably the latter clutch was the production of two females. Mr. Salvin visited a breeding-station of these birds situated on the marshes in the interior of Algeria: the whole flock rose in the air and came wheeling round uttering their peculiar notes, some of them coming within a few feet of his head, and then retiring again; finally they all alighted one by one on the ground, some lying on the ground as if dead for a few moments, then suddenly rising again to circle overhead anew.

The eggs of the Pratincole are very fragile, oval in form, being scarcely more pointed at one end than the other. They vary in ground-colour from citron or yellow-ochre to pale slate, richly spotted all over with streaks and blotches of dark brown, approaching black, in some instances most so at the larger end. The underlying spots of pale greyish brown are usually very distinct, and often impart great beauty to the egg, giving it a marbled appearance. They vary in length from 1·35 to 1·1 inch, and

in breadth from 1·0 to ·9 inch. It is scarcely possible to confuse the eggs of the Pratincole with those of any other British bird.

The adult male Pratincole in autumn plumage has the upper parts greyish brown, much darker on the primaries and primary-coverts; the secondaries are broadly tipped with white, and the rump, upper tail-coverts, and basal portion of the tail-feathers are white. A black line begins at the base of the bill, and passing through the lores and underneath the eye, encircles the chin and throat, which are buff; there is also a slight black moustachial stripe; the sides of the neck and the breast beyond this black line are greyish brown, shading into buff on the lower breast and into white on the rest of the underparts; axillaries chestnut, under wing-coverts mixed black and chestnut. Bill black, crimson at the base; legs, feet, and claws dark brown; irides dark hazel. The female is slightly duller in colour than the male; the black on the lores is less developed, the black moustachial line is entirely absent, and the white tips of the secondaries are narrower and less defined. The spring plumage does not appear to be attained by a moult, and only differs from that of autumn in being somewhat duller, the buff on the throat and lower breast being more or less faded, and sometimes disappearing altogether. Young in first plumage have the outside tail-feathers shorter than in adults; nearly all the feathers have pale margins, and most of the small ones have nearly white tips, which are emphasized by nearly black subterminal bars. In the plumage of the bird of the year, which is attained by a complete moult, the feathers of the upper parts have obscure buff margins, the throat is streaked, and the black line round it only indicated by streaks. Young in down are white on the underparts and buff obscurely marked with brown on the upper parts *.

* Dresser appears to have confused the plumages of birds of the year and young in first plumage, which are very distinct. He figures a bird of the year of *Glareola melanoptera*, which he erroneously says closely resembles the young of *G. pratincola*, of which he only describes the young in first plumage. It is a pity that any one should attempt to describe the plumage of birds without having first made himself master of the changes which they undergo.

Genus HIMANTOPUS.

The genus *Himantopus* was established in 1760 by Brisson in his 'Ornithologia,' v. p. 33, for the reception of the Stilts. The Common Stilt (*H. candidus*), being the *Himantopus himantopus* of Brisson, is the type. Brisson placed the Avocet in a separate genus, *Avocetta*, which is a synonym of the genus *Recurvirostra* of Linnæus, neither of these great ornithologists being acquainted with the Australian species, which forms the connecting link between them.

The Stilts may be distinguished from the birds in the other genera in this family in which the tarsus is reticulated all round by their very long legs. They may be divided into three subgenera, which are distinguished as follows:—

Feet webbed { *Recurvirostra.* / *Cladorhynchus.* } Hind toe absent.
Himantopus.

This genus contains ten species, and may be regarded as cosmopolitan, except that it is not represented in the Arctic Region. There are four Avocets and five Stilts, each of which group has a single representative in Europe; the species which combines both characters is confined to Australia.

The Stilts frequent the margins of pools in extensive salt-marshes and the low-lying sea-coasts. They are more or less gregarious, and live in scattered colonies. They walk in a very graceful manner, and run quickly, often wading to some considerable depth. Their flight is moderately powerful and often long sustained, and their long legs are stretched out behind, in the same manner as those of the Heron. Their notes are loud and clear. Their food consists of small shells and aquatic insects, for which their long bills enable them to search amongst the mud. Their nests are merely slight depressions near the water, lined with a little dry herbage; and their eggs are generally four in number, buff in ground-colour, spotted and blotched with brown of various shades.

HIMANTOPUS AVOCETTA.

AVOCET.

(Plate 24.)

Avocetta avocetta, *Briss. Orn.* vi. p. 538, pl. 48. fig. 2 (1760).
Recurvirostra avocetta, *Linn. Syst. Nat.* i. p. 256 (1766); **et auctorum plurimorum**—*Naumann, Temminck, Schlegel, Cabanis, Saunders,* &c.
Scolopax avocetta (*Briss.*), *Scop. Ann. I. Hist. Nat.* p. 92 (1769).
Avocetta europæa, *Dumont, Dict. Sc. Nat.* iii. p. 339 (1816).
Recurvirostra sinensis, *Swinhoe, Ibis,* 1867, p. 401.

At the commencement of the present century the Avocet was a well-known and common summer visitor to the low-lying eastern counties of England; but now, owing to the drainage of its favourite fens and the reclamation of its chosen marshes, it is only known as a straggler on migration. At irregular intervals a few Avocets appear in spring, less frequently in autumn, at what was formerly their breeding-grounds; but they are remorselessly shot down by collectors of rare birds. There is no reliable evidence that the Avocet has bred in our islands for the past sixty years. Its breeding-haunts were apparently confined to the marshes of Lincolnshire, Norfolk, Suffolk, and Romney Marsh in Kent. To the rest of England the Avocet was, and is, only known as an accidental straggler, becoming much rarer in the north. Only about half a dozen specimens have been recorded from Scotland, where it has been met with as far north as the Shetlands, and as far west as Stornoway, in the Outer Hebrides. In Ireland it is equally scarce, being only known as an extremely rare straggler.

The increase of population and the drainage of marshes have restricted the breeding-places of the Avocet in Europe to the islands off the coast of Denmark and Holland, the marshes of Southern Spain, the delta of the Rhone, and the lagoons on the shores of the Black Sea. To Southern Scandinavia and the rest of Central and Southern Europe, with the exception above mentioned, the Avocet has become, as it is in our islands, only an accidental visitor; but further east it is more abundant, breeding in Palestine and Persia, where it is a resident, and in North Turkestan, the extreme south-west of Siberia, South-east Mongolia, and South Dauria, where it is a summer visitor, wintering in China, Formosa, Hainan, India, and occasionally Ceylon. It has been recorded from the main island of Japan. In Asia Minor it is principally known on passage, though a few are said to remain during the winter; and it is said to breed throughout Africa in suitable localities.

The Avocet has no very near ally, and may always be known by its

black crown and nape. In Australia and New Zealand it is represented by *H. novæ-hollandiæ,* easily distinguished by its chestnut head. In the temperate parts of the continent of North America it is represented by *H. americanus,* which differs principally in having the head white in winter, grey in autumn, and dull chestnut in summer. In the Andes of Peru it is represented by a more distantly allied species, *H. andinus,* having a white head and uniform dark brown wings and tail.

The Avocet arrives at its breeding-grounds in Western Europe in April, departing late in August or early in September. It frequents sandy coasts and extensive marshes, lagoons, and sand-banks. In the haunts it selects it shows a similar choice to the Stilt, and many of its habits resemble those of that bird. Like that graceful species, it haunts the margins of the water, running daintily along the wet shining sands, or exploring the black mud-banks in the shallow lakes. It is a very conspicuous bird, because the contrast of its plumage is so striking. It is not particularly shy, but, if alarmed, will mount into the air, its long legs stretched out behind in a line with its bill, and fly round and round, uttering its alarm-note, which resembles the syllables *tüt, tüt, tü-it, tü-it.* On the wing the Avocet has a very strange appearance, looking like a series of black and white stripes. If one of the birds is wounded, its companions fly round overhead, incessantly uttering their notes as if bewailing its fate. At all seasons of the year the Avocet is sociable, and may be observed in large or small parties. It is a very beautiful sight to watch a party of these birds, when their nesting-grounds are invaded, daintily running before you, their brilliant plumage contrasting strongly with the mud or sand. Every now and then they run a little way with uplifted wings, occasionally rising in the air and flying round your head, uttering their anxious cries. The bird wades into water as deep as its belly, and will even venture further, for it swims with ease, sitting lightly and gracefully on the water. In the course of their wanderings over the mud-flats and tide-washed sands they often swim a little distance across a stretch of deep water, and, if pursued, will readily make use of their swimming-powers to carry them out of danger.

The food of the Avocet is captured principally on the mud and in marshy places. It is chiefly composed of worms, small crustaceans, and vast quantities of aquatic insects. This prey is searched for as the bird moves its long slender recurved bill from side to side across the surface of the sand or mud, or in the shallows. The Avocet never appears to probe into the soft ground with its bill, but always uses it in a side direction. A small quantity of gravel is swallowed to aid digestion. Sometimes the bird captures the small gnats and other insects as they flutter over the water or flit by it on the land.

The breeding-season of the Avocet commences in the first half of May

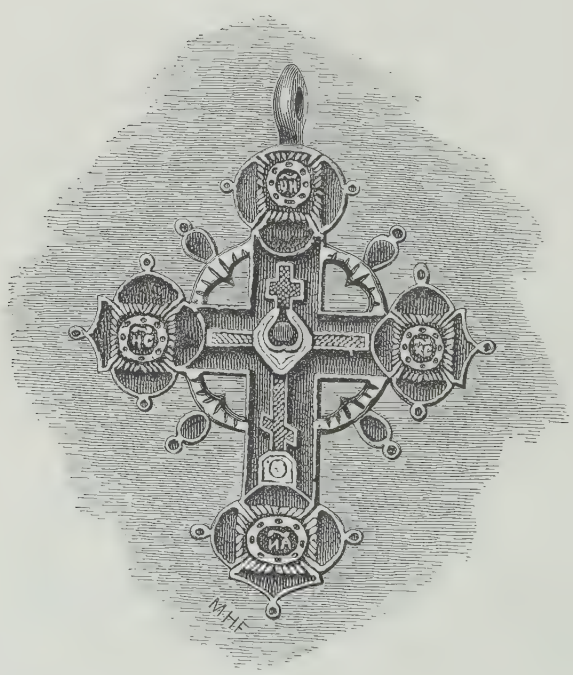
in Western Europe, but in Eastern Europe, in the valley of the Danube, where the seasons are later, its eggs are not laid before the beginning of June. I have taken the eggs of this bird in Jutland and in the valley of the Danube. The west of Jutland is flat—not a dead flat, but gently undulating. Its most striking peculiarity is the almost entire absence of trees. It has evidently once been sand, with a deposit of bog in the lower lands. Sometimes for miles you travel over desolate and monotonous heaths; but where the soil is better it is drained and cultivated. These parts of the country look less desolate, but quite as monotonous. The houses are scattered over the country, seldom collected in villages, each the facsimile of the other, and without a single element of picturesqueness. At Tarm a river winds through some extensive marshes, and often in many channels reaches a fjord perhaps six or eight miles off. These marshes are rich in birds. At the south end of this fjord is a peninsula, a square mile or two in extent, separated by a narrow bay from the line of sand-hills or dunes which flank the sea. To this paradise of Waders I made a visit on the 15th of May, 1879, in search of the colony of Avocets which breeds there every year. We drove across country along hard roads, sandy tracts, over mud, through water, to the grassy flat of the promontory. We were a party of six besides the driver. Mr. Benzon, of Copenhagen, and Mr. Seehusen kindly piloted us to the spot. My friend Capt. Elwes and I occupied the one seat, and on a plank at our feet sat our stolid driver, smoking his pipe; by his side an old man with a gun, who was supposed to thoroughly understand the geography of the peninsula, but who found it necessary to pick up a bare-footed lad who was erroneously imagined to have a personal acquaintance with the nesting-grounds of each species of bird in the district. As we drove along we stopped to shoot a pair of Dotterel feeding on a fallow, with two or three others on their way to the fjelds of Norway to breed. As we neared the fjord, Lesser, Common, and Black Terns flew past us; and when we arrived on the peninsula we were soon the centre of attraction of Dunlins, Redshanks, and Ringed Plovers, whose breeding-grounds we were invading. A flock of Curlews would not allow us to come within range. Dunlins were mostly in pairs, and we took a nest or two of eggs. We found a few Redshank's eggs, but were evidently too early for the Ruffs. Ringed Plovers had young a few days old, but the Gulls and Terns had not begun to breed. All this time we searched in vain for the Avocets. We saw neither birds nor eggs. Our guides declared that we were a fortnight too early, and that the birds had not arrived. We retraced our steps and had little more than a mile further to go, when we caught sight of a bird struggling in a snare on a grassy flat, separated by a half-dried-up stream full of black mud and *Equisetæ* from the main promontory. We soon struggled across, and were delighted to find an Avocet caught in a snare, placed over

a nest containing four eggs. In five minutes we found five more nests, three containing four eggs each, and the others only two. Over each nest a snare was placed. One Avocet only flew over whilst we were there, probably the mate of the captured bird; it uttered its somewhat feeble and monosyllabic cry. The nests were mere hollows in the short grass, with a small handful of dry grass and leaves as lining. We waited some time, and a pair of birds came back. They seemed to have swam ashore, as they came from the sea, and were not seen to alight. They did not appear to have discovered that the nests had been robbed; for when some Gulls came over they flew up at them and chased them away with screams. Rejoining our conveyance we crossed some shallow water and made for the "dunes." About halfway across we came upon a party of perhaps fifty Avocets walking in the shallow water and moving their bills from side to side in the sand at the bottom, occasionally tossing up their heads. We tried to stalk them with our heavy conveyance; but our driver made a muddle of it, and a right and left barrel failed to get us a second specimen. The nests I found in the valley of the Danube on the 10th of June, 1883, were most of them slight, but some had more foundation than others. They were always built on the dry land.

The eggs of the Avocet are three or four in number, but in exceptional cases it is said that as many as five have been found. They are pale buffish brown in ground-colour, spotted and blotched with rich dark brown, and with underlying markings of grey. They are pyriform in shape, and are subject to but little variety in colour. On some specimens the spots are small and evenly dispersed over the entire surface, whilst on others they more frequently take the form of irregular blotches. They vary in length from 2·0 to 1·9 inch, and in breadth from 1·45 to 1·35 inch. Some eggs of the Avocet are almost indistinguishable from certain varieties of the eggs of the Grey Plover and the Lapwing; but, as a rule, the eggs of the former are richer in ground-colour, and those of the latter are smaller, darker, and more heavily marked. It is said that both parents assist in incubating the eggs. Only one brood appears to be reared in the year. Some doubt exists as to how the old birds feed their young; and as no one has yet observed them being fed by their parents, the interesting question is still undecided. During winter the Avocet is even more gregarious than in summer. Large flocks are formed, sometimes containing hundreds of individuals, which frequent the sea-coasts, as well as the inland lakes and marshes.

The adult male Avocet in breeding-plumage has the head and nape extending to the back of the neck, the primaries, scapulars, and a band across the wing, reaching from the shoulder almost to the tips of the innermost secondaries, black; the remainder of the upper parts and the whole of the underparts are white. Bill black; legs and feet light blue;

irides chocolate. The female scarcely differs in colour from the male, except that the black is browner and the white is not so pure, and the legs are a little shorter. Young in first plumage have the black parts still browner, most of the feathers having pale edges, and the white parts are still more suffused with brown. Males of the year closely resemble adult females. The winter plumage does not differ from that of summer. The young in down are almost white, variegated with brown on the head and back.



HIMANTOPUS MELANOPTERUS.

COMMON STILT.

(Plate 24.)

Himantopus himantopus, *Briss. Orn.* v. p. 34 (1760).
Charadrius himantopus, *Linn. Syst. Nat.* i. p. 255 (1766).
Himantopus candidus, *Bonn. Tabl. Encycl.* i. p. 24 (1790).
Himantopus vulgaris, *Bechst. Orn. Taschenb.* ii. p. 325, pl. 28 (1803).
Cursorius himantopus (*Briss.*), *Turton, Brit. Faun.* p. 62 (1807).
Himantopus rufipes, *Bechst. Naturg. Deutschl.* iii. p. 446 (1809).
Himantopus atropterus, *Meyer, Taschenb.* ii. p. 315 (1810).
Himantopus melanopterus, *Meyer, Ann. Wetter. Gesellsch.* iii. p. 177 (1814); **et auctorum plurimorum**—*Temminck, Schlegel, Tristram, Blyth, Elwes, Gurney, Shelley, Saunders, Hartlaub, Cabanis, Homeyer, Salvadori, Finsch, Taczanowski, Lichtenstein, Lindermeyer, Yarrell*, &c.
Himantopus albicollis, *Vieill. N. Dict. d'Hist. Nat.* x. p. 41 (1817).
Hypsibates himantopus (*Briss.*), *Nitzsch, Ersch & Grub. Encycl.* xvi. p. 150 (1827).
Himantopus plinii, *Flem. Brit. An.* p. 112 (1828).
Himantopus asiaticus, *Less. Rev. Zool.* 1839, p. 44.
Himantopus intermedius, *Blyth, Cat. B. Mus. As. Soc.* p. 265 (1849).
Himantopus autumnalis (*Hasselquist*), *apud Gray, Holdsworth, Legge, Heuglin, Walden, Gurney*, &c.

There seems to be no evidence that the Common Stilt has ever bred in our islands; but it has occurred so many times that it may fairly be classed as an accidental visitor on migration. It was first recorded as a British bird by Sir Robert Sibbald in 1684, who described and figured, in his 'History of Scotland,' one of a pair which had been shot at a lake near Dumfries, and which were sent to him by a Mr. W. Dalmahoy. It has occurred most frequently on the south and east coasts of England, having wandered as far inland as Nottinghamshire. In Scotland it is only of very rare occurrence; but it has strayed as far north as the Orkney and Shetland Islands. To Ireland it is even a less frequent visitor, and only three or four instances of its capture are recorded.

The Common Stilt is most abundant during the breeding-season in India and Ceylon, where its numbers are increased during winter. Further east it is found during the cold season in Burma; and stragglers have occurred in Cochin China, Timor, the Philippine Islands, and North China. West of India it is a regular summer visitor to Afghanistan, Turkestan, North Persia, Palestine, Asia Minor, to the salt-lakes of the Kalmuk and Kirghis steppes, the lagoons on the shores of the Black Sea, the delta of the Rhone, and the marismas of Southern Spain and Portugal. It is an accidental straggler on migration to the rest of Europe as far north as the Baltic. It is a resident in Northern Africa; but its numbers

are largely increased during winter, and it has been found in various localities throughout the continent; but no reliable evidence of its breeding in South Africa has been obtained. It has been found both on the Canary Islands and Madagascar.

The Common Stilt has three very near allies: one of them (*H. mexicanus*), which is found on the American continent north of the equator, is readily distinguished by the black on the back of the neck being continuous with the black of the back. On the American continent south of the equator *H. brasiliensis* occurs, and in Australia and New Zealand *H. leucocephalus* is found—in both of which the entire head is always white and the back of the neck black, but separated by a broad white collar from the black of the back, as in our bird, which, when it has a white head, has no black at the back of the neck. A fifth species (*H. novæzelandiæ*) is entirely blackish in summer, and at all times of the year has the tail black.

The Stilt is essentially a bird of the marshes, though it never enters the reeds. It is especially fond of salt-marshes, wading in the shallow water outside the reed-beds, or running on the yellow weed (a species of *Alga*) which floats in acres over the black treacherous mud between the reeds and the open water. A few Stilts winter in the basin of the Mediterranean; but most of them are migratory birds. Late in March or early in April it arrives from its winter-quarters in Africa, at Gibraltar, Malta, and Greece, in small parties, which feed for a short time on the shore, but soon pass on to their breeding-places. The lagoons on the western shores of the Black Sea are special favourites of this charming bird; they are large sheets of water, shut off from the sea by a long sand-bank or a row of sand-islands, and generally terminate on the land side in a great reed-bed, at the far end of which a little stream runs into the lagoon. On many of these lagoons, both north and south of Kustendji, the Stilt breeds in considerable numbers. I have taken its eggs both at Lake Tusla to the south and Lake Sinoe to the north. It is a somewhat late breeder in this locality, and full clutches are rarely obtained before the first half of June; but in Spain (where the winters are so much milder and the spring so much earlier) full clutches are to be found during the first half of May. Col. Irby says that he has seen eggs from the marismas of the Guadalquiver, where the Stilt breeds in great numbers, as early as the 28th of April.

Few sights are more interesting to an English ornithologist than a breeding colony of Stilts. If quietly approached, they may be watched standing up to their knees in water, catching little tadpoles and water-beetles, picking up floating shell-fish, or snapping at the gnats in the air, or the water-spiders dancing on the surface of the lagoons. Perhaps it looks most elegant as it trips daintily on the yellow ooze, which scarcely

seems to bend beneath its light weight. Sometimes two or three may be seen feeding together, walking with deliberate graceful step, which is occasionally quickened almost into a run; but they seldom utter a note. They do not seem to be particularly shy; and it is not necessary to keep concealed amongst the reeds, except when you approach the nests. Then the habits of the birds change entirely: all idea of feeding is given up; their whole attention is absorbed in the effort to decoy you from the colony; they are alarmed for the safety of their eggs, and in their excitement they suddenly become noisy birds. As they run along the sand, with uplifted wings, they look the perfection of beauty and grace; but they soon take wing, and try hard to lead you inland to the steppe. Generally two or three fly together, looking almost like miniature Storks as they pass over: the neck is outstretched and the bill is slightly depressed; whilst the long red legs, which reach considerably beyond the tail, are also extended slightly below the horizontal line. The motion of the wings is not very rapid, but the line of flight is straight; now and then the bird skims along for a short distance with outspread motionless wings; and whilst thus sailing slowly along it has a curious habit of dropping its legs; but this action is performed so high in the air that the bird can scarcely be making preparations to alight, and may perhaps only be trying to attract attention to itself. All this time the birds are noisy enough. It has two cries of anxiety at the nest—one a sharp rapidly repeated *kit, kit, kit,* or *hit, hit, hit,* and the other a sort of rattling note, resembling the syllable *peur-r-re.* As the wily bird succeeds in luring the intruder away from its treasures, it does not fly so near him; the former note only is heard, and is less rapidly and less anxiously repeated; the final *t* is omitted or is inaudible, and the note sounds like *kee, kee, kee.*

When Mr. Young and I were in the Dobrudscha in 1883 we found a small colony of seven nests on the 7th of June. The first nest was somewhat isolated, built amongst the very outermost straggling reeds, and two or three birds were standing in the water not very far from it. It was very flat, and stood from two to three inches above the level of the water; the slight hollow was about six inches across, and the nest was about eight inches in diameter at the surface of the water. It was entirely composed of broken bits of old dead reeds, the slenderest pieces being reserved for the lining. Twenty yards further on was the main colony, consisting of five similar nests, built on the bare black mud between the reeds and the water, and distributed over a space of perhaps twenty or thirty yards; whilst the seventh nest was again somewhat isolated, built in the water at least six feet away from the reeds, and placed upon a heap of yellow ooze, which had evidently been collected for a foundation. One nest contained a single egg; the other six had the full clutch of four: all the eggs were fresh except one clutch, which was slightly incubated.

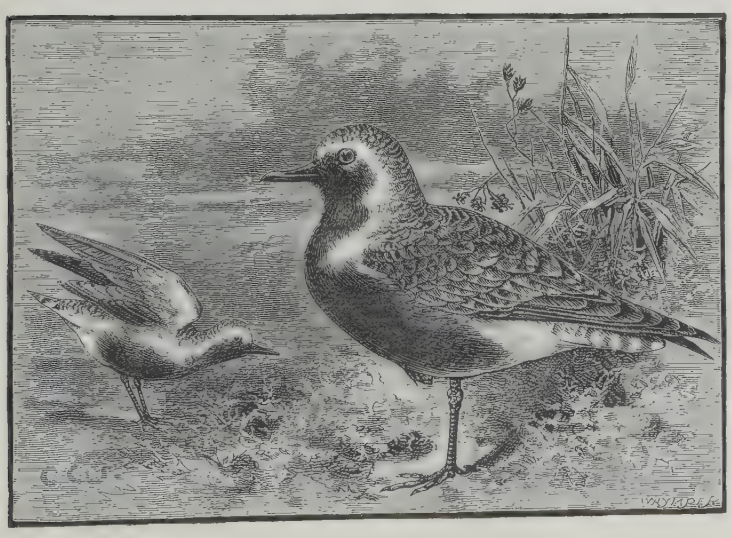
The Common Stilt breeds in enormous numbers in Upper India. One of its great stations is at a large salt-works not far from Delhi. The birds are here seen in small parties throughout the year; but about the middle of April they congregate in great numbers for breeding-purposes. The works are composed of many acres of shallow evaporating-pools, mere depressions dug in the ground and lined with fine lime; these small pools are divided by narrow strips of land, varying from a foot to six feet broad, and on the margins of these, or even in those pools which contain little water, the Stilts make their nests. They collect the small pieces of lime with which the pools are lined, making a round platform from seven to twelve inches in diameter and two or three inches in height; this little platform is then covered with a little dry grass, on which the birds deposit their eggs. They usually lay four eggs, but sometimes only two or three. The first eggs are laid about the end of April or early in May; but most of them are laid in June. Many of the nests are close together; and Hume records that on one strip of land, about three feet wide and a hundred feet long, there were thirty-eight nests, besides five nests of the Red-wattled Lapwing. At these works the birds are exceedingly tame, and allow the workmen to pass within a few inches whilst sitting on their eggs.

The eggs of the Common Stilt are pale buffish brown in ground-colour, spotted, blotched, and streaked with blackish brown, and with underlying markings of inky grey; some have the ground-colour much richer than others, and the character of the markings is subject to considerable variety. Some eggs are boldly and clearly blotched, a few of the larger blotches being connected by irregular streaks; others are blotched, but the colour is paler and the blotches are not so clearly defined. Most of the markings are on the surface, and on some specimens pale and dark brown blotches and spots occur. The eggs are pyriform in shape, and vary in length from 1·85 to 1·5 inch, and in breadth from 1·32 to 1·1 inch. They are not easily confused with the eggs of any other British species, but only differ in size from those of the Avocet. Only one brood appears to be reared in the year.

The fully adult male Common Stilt in breeding-plumage has the mantle, scapulars, wings, and upper and under wing-coverts black, glossed with green on the upper parts; the upper tail-coverts and tail are pearly grey; and all the rest of the plumage is pure white. Bill black; legs and feet pale crimson; claws black; irides crimson. The female is slightly duller in colour than the male, and always has some dull black feathers on the hind head and nape *. In the perfectly adult male there is no difference

* Dresser describes the adult female as having a brown back, and adds that Naumann appears to him to be in error in describing it as black. Messrs. Oates, Legge, and Saunders all agree with me that Naumann is right.

between summer and winter plumage; but in not quite adult birds of both sexes (and by far the greater majority of breeding-birds are in this plumage) the hind head and the back of the neck are more or less mixed with dull black feathers in summer, which are moulted into brown feathers in autumn. There does not seem to be any evidence that the spring moult extends beyond the head and neck. In young in first plumage the small feathers, which are glossy black in the adult, are dark brown with pale edges; the primaries are dull black, and the innermost ones are narrowly margined with white; the wing-coverts have pale tips, and the secondaries broad white tips; the hind head and neck are greyish brown, darkest on the former, with buff margins to the feathers; the legs and feet are brownish yellow. In birds of the year the buff margins to the feathers of the head and back and the pale tips of the wing-coverts have almost disappeared. After the first spring moult the nearly adult plumage is assumed, but the brown back is retained until the following autumn. Young in down have the upper parts greyish buff mottled with black and the underparts white.



GREY PLOVER.

Genus PHALAROPUS.

The Phalaropes were placed by Linnæus in the genus *Tringa*; but in 1790 Latham recognized the validity of the genus *Phalaropus*, which Brisson had established in 1760 for their reception in his 'Ornithologia,' vi. p. 12. The Grey Phalarope, *P. fulicarius* (being the *Phalaropus phalaropus* of Brisson), is the type.

The Phalaropes have the tarsus scutellated both before and behind, and have a small hind toe. They may be distinguished by their lobed feet, and by the softness of their plumage, in which respect they resemble the Avocets, the Rails, and the Auks.

The Phalaropes are confined during the breeding-season to the northern portion of the Nearctic and Palæarctic Regions, retiring south to winter. Only three species are known, one of which breeds in Europe and the British Islands, the other being a winter visitor to our shores, whilst the third is only found on the American continent.

The Phalaropes are more aquatic in their habits than any other bird in this family. They frequent the sea-coast, especially fjords, and less frequently inland sheets of water. They are remarkably tame and confiding, sometimes allowing themselves to be captured by the hand. In their habits, food, flight, and mode of progression on the ground they do not differ much from the species in the preceding genera, but they swim with the greatest ease. They make their nests generally near water, on the ground; and their eggs are pyriform in shape and four in number.

PHALAROPUS FULICARIUS.

GREY PHALAROPE.

(Plate 27.)

Phalaropus phalaropus, *Briss. Orn.* vi. p. 12 (1760, winter plumage).
Phalaropus rufescens, *Briss. Orn.* vi. p. 20 (1760, summer plumage).
Tringa fulicaria, *Linn. Syst. Nat.* i. p. 249 (1766); **et auctorum plurimorum**—(*Bonaparte*), (*Swainson*), (*Audubon*), (*Baird, Brewer, and Ridgway*), (*Coues*), (*Dresser*), (*Saunders*), &c.
Phalaropus lobatus (*Linn.*), apud *Tunstall, Orn. Brit.* p. 3 (1771).
Phalaropus rufus, *Bechst. Naturg. Deutschl.* ed. 2, iv. p. 381 (1809).
Phalaropus platyrhynchus, *Temm. Man. d'Orn.* p. 459 (1815).
Phalaropus griseus, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 34 (1816).
Crymophilus rufus (*Bechst.*), *Vieill. N. Dict. d'Hist. Nat.* viii. p. 521 (1817).
Phalaropus fulicarius (*Linn.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 54 (1838).
Phalaropus platyrostris, *Nordmann, Demidoff, Voy. Russ. Mérid.* iii. p. 250 (1840).
Phalaropus asiaticus, *Hume, Stray Feath.* i. p. 246 (1873).

The Grey Phalarope was first described as a British bird in 1757 from an example which was shot near Halifax, in January of that year, by Mr. Thomas Bolton, a florist of Worley Clough, in Yorkshire, who sent it to Mr. Edwards, who described it in the 'Philosophical Transactions' (l. p. 525), and afterwards figured it in his 'Gleanings in Natural History' (iii. pl. 308). It must be regarded as a rare accidental visitor to our shores, but one which, like the Waxwing, occasionally appears in great numbers. The most important migration of Grey Phalaropes to our islands occurred in the autumn of 1866. From August the 20th to September the 11th the recorded captures averaged one a day; from September the 12th to the 25th, an average of fifteen a day was secured; whilst from September the 26th to October the 8th the average again fell to one a day. To these must be added about a hundred and fifty of which the precise dates are not known, and probably as many more whose capture has not been recorded. Knox, in his 'Ornithological Rambles in Sussex,' states that in September 1846 great numbers of Grey Phalaropes appeared on various parts of the coast of Sussex. With the exception of these two irruptions, it is not known that the Grey Phalarope has ever visited this country in any numbers, though a year seldom passes without a few being observed, generally in small parties. Most of these occurrences have been on the south coast of England, though some examples have been obtained inland, in various localities, both in Wales, Scotland, and Ireland.

The Grey Phalarope is a circumpolar bird, and breeds in Iceland,

Spitzbergen, and in the Taimyr peninsula. It has also occurred in Lapland and in the Tchuski Land, though it is not known to breed in either of these localities. On the American continent it breeds from Alaska to Greenland, and ranges as far north as lat. 82½° in British North America. It is a somewhat irregular visitor on migration to Europe, and has occurred once in Tangiers. It is not known to pass through Turkestan or South Siberia on migration, but it winters on the Mekran coast and Scind. Severtzow says that it is a rare visitor to the Pamir, and a single example has been recorded from Calcutta. I have examples in my collection from Kamtschatka and the Kurile Islands. On the American continent it has occurred on both the Atlantic and the Pacific coasts, at least as far south as lat. 40°; and Audubon records the occurrence of a flock, consisting of at least a hundred individuals, on the banks of the Ohio, in lat. 38°. The Grey Phalarope has no very near ally.

The Grey Phalarope is one of the few British birds that I have never had an opportunity of seeing alive. It seems to be a gipsy migrant, in mild seasons many of the adults remaining to winter in the Norwegian fjords, whilst birds of the year wander further south. On the Asiatic coast it appears to find abundant food during winter in the sea round the Kuriles. Its unusual migrations are probably the results of excessive cold or violent storms in its usual winter-quarters. Respecting the great migration of these birds to England in 1866, Gurney remarks that severe gales prevailed during September, and that icebergs came further south than had ever been known before.

In winter these birds spend most of their time on the sea, picking up food from the surface of the water. They are even more gregarious in their habits than the Red-necked Phalarope, and are often found in large flocks. Those which have been obtained in this country appeared to be singularly tame; but Hume, who met with them in their winter-quarters on the coast of Scind, found them "very wary, rising *en masse*, and skimming along the surface of the water for a couple of hundred yards or so as soon as the boat approaches within a hundred yards of them." They float very buoyantly on the water and rise with great ease. When swimming they progress in a jerky manner with a bobbing motion of the head; but it is not known that they ever dive. They are frequently seen at great distances from shore; and Mr. Kumlien once met with flocks of Grey Phalaropes two hundred miles from the Labrador coast; he also says that they follow the whales, approaching them when they blow to catch the small marine animals that are disturbed. From this peculiarity this bird is frequently known as the "Whale Bird" and the "Bow-head Bird" amongst the whalers. Sabine saw the Grey Phalarope floating amongst the icebergs several miles from shore; and it always appears to prefer to escape from danger by swimming than by using its wings.

The food found in the stomachs of some of those examples which were captured in England consisted of gnats, which they were seen to catch on the surface of the water with great rapidity, other small water-insects, crustaceans, little worms, and bits of vegetable fibres. This species also obtains much of its food from the large floating masses of seaweed, running about them as unconcernedly as if it were on dry land.

At their breeding-grounds they are described as being very tame and as running with great rapidity on the margins of the pools and lakes where they rear their young, and, when alarmed, preferring to seek safety on the water than to take wing. Faber, who met with this species breeding in Iceland, describes their call-note as resembling the syllable *eem*; whilst their alarm-note, which is principally heard on the wing, is represented by the syllables *bick-a, bick-a,* rapidly repeated. This last note must be almost the same as that of the Red-necked Phalarope. They are said not to make any nest, but to deposit their four eggs in a slight depression in the grass or amongst the shingle; occasionally a few leaves are added as a lining. The eggs are laid about the middle of June, young in down are seen running about early in July, and by the middle of August both old and young have left their breeding-grounds.

The eggs of the Grey Phalarope are four in number. The ground-colour is pale buffish brown, slightly tinged with olive. They are profusely spotted and blotched with very dark brown, the spots being largest and frequently confluent at the large end of the egg; the underlying spots are few in number and very pale greyish brown. They vary in length from 1·28 to 1·2 inch, and in breadth from ·9 to ·85 inch. The eggs of this species very closely resemble those of the Red-necked Phalarope, but may generally be distinguished by their larger size. Only one brood appears to be reared in the year.

As in the Red-necked Phalarope, the male appears to be less brilliantly coloured than the female, because he occupies himself principally with the duties of incubation and the care of the young. The adult female Grey Phalarope in breeding-plumage has the whole of the underparts chestnut, except the axillaries and under wing-coverts, which are white, and the chin and upper throat, which are dark brown; the chestnut extends on the sides of the neck and almost meets at the nape, and the brown on the chin extends to the forehead and crown, leaving a large white patch round the eye. The back, scapulars and innermost secondaries, and the shortest upper tail-coverts are black with buffish-yellow margins, and the longest upper tail-coverts are chestnut like the underparts; the wings and tail (which is much graduated) are slate-grey, the greater wing-coverts have broad white tips, the secondaries have narrow white tips, the two centre tail-feathers are suffused with brown, and the two outer tail-feathers on each side are suffused with chestnut towards the tips. Bill yellow, black at the tip; legs olive-

brown; irides dark hazel. The male differs from the female in having the chestnut on the underparts slightly duller in colour, extending to the chin, and streaked with brown on the flanks; the feathers on the head are coloured like those on the back, and the white patch on the sides of the head round the eye is more or less marked with brown. After the autumn moult the whole of the chestnut on the underparts and the brown on the chin, lores, forehead, and crown become pure white; the feathers in front below and behind the eye are dark slate-gray; the wings remain the same colour as in the summer plumage, but all the rest of the feathers from the nape downwards become an almost uniform slate-gray, the feathers of the back having darker shaft-streaks, and the scapulars and innermost secondaries having narrow white margins. The bill becomes almost black, somewhat paler at the base of the lower mandible. Birds of the year resemble adults in winter plumage, but have the white above the eye separated from the white on the crown by a dark band which joins the dark nape, which, as well as the mantle and the wing-coverts, are much darker than in the adult in winter plumage. There are also traces of buff margins to some of the feathers on the upper parts. Young in first plumage closely resemble on the underparts adults in winter plumage, but the colour of the upper parts is very similar to that of the male in summer plumage. Young in down are described by Baird, Brewer, and Ridgway as very closely resembling those of the Red-necked Phalarope; but as no mention is made of the two nearly white stripes down the back, it is probable that they are buffish brown like the rest of the upper parts.

PHALAROPUS HYPERBOREUS.

RED-NECKED PHALAROPE.

(Plate 27.)

Phalaropus cinereus, *Briss. Orn.* vi. p. 15 (1760, summer plumage).
Phalaropus fuscus, *Briss. Orn.* vi. p. 18 (1760, winter plumage).
Tringa lobata, *Linn. Syst. Nat.* i. p. 249 (1766, winter plumage).
Tringa hyperborea, *Linn. Syst. Nat.* i. p. 249 (1766, summer plumage); **et auctorum plurimorum**—(*Latham*), (*Audubon*), (*Cuvier*), (*Coues*), (*Dresser*), (*Saunders*), &c.
Phalaropus hyperboreus (*Linn.*), *Tunstall, Orn. Brit.* p. 3 (1771).
Tringa fusca (*Briss.*), *Gmel. Syst. Nat.* i. p. 675 (1788).
Phalaropus vulgaris, *Bechst. Orn. Taschenb.* ii. p. 317, pl. xxvii. (1803).
Phalaropus williamsii, *Simmonds, Trans. Linn. Soc.* viii. p. 264 (1807).
Phalaropus cinereus (*Briss.*), *Meyer, Taschenb.* ii. p. 417 (1810).
Lobipes hyperborea (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. i. p. 169 (1824).
Phalaropus ruficollis, Phalaropus cinerascens, *Pall. Zoogr. Rosso-Asiat.* ii. pp. 203, 204 (1826).
Phalaropus angustirostris, *Naum. Vög. Deutschl.* viii. p. 240, pl. 205 (1836).
Phalaropus lobatus (*Linn.*), *Salvad. Ucc. d'Ital.* ii. p. 210 (1871).
Lobipes lobatus (*Linn.*), *Baird, Brewer, & Ridgw. Water-B. N. Amer.* i. p. 330 (1884).

The Red-necked Phalarope formerly bred in the counties of Perth and Inverness, in the Orkneys, and possibly also in Sutherland and the Isle of Skye, but is now only known to breed in the Shetlands and the Outer Hebrides. To the rest of Scotland and to England it is only a rare accidental visitor, and has never been found in Ireland. It was recorded as a British bird as long ago as 1676 by Willughby and Ray from an example in the collection of Ralph Johnson of Brignal, near Greta Bridge, in Yorkshire, a gentleman to whom these great naturalists were indebted for much valuable ornithological information.

The Red-necked Phalarope is a circumpolar bird, breeding principally on the tundras above the limit of forest-growth as far north as land extends in the eastern hemisphere, and in the western hemisphere up to lat. 73°. It rarely breeds south of the Arctic circle; but above the pine-regions of the Dovrefjeld it breeds as far south as lat. 62°, and on the Pacific coast Middendorff found it breeding on the west shores of the sea of Ochotsk as far south as lat. 55°. It is a summer visitor to Greenland, Iceland, and the Faroes. In winter it frequents the coasts of Europe, but is very rare in the basin of the Mediterranean, and has not occurred in North-east Africa, Palestine, or Asia Minor. It occurs during passage on most of the great internal lines of migration, and winters in Persia and

occasionally in North India. It passes the coasts of Japan on migration, and winters in China and the islands of the Malay archipelago as far south as New Guinea. In the western hemisphere it winters in the United States, Mexico, and Central America. Several examples have been obtained on the Bermudas. The Red-necked Phalarope has no very near ally.

The Red-necked Phalarope is a most charming bird at its breeding-grounds. Nothing can exceed its tameness when newly arrived. It frequents the little pools on the tundra, and sometimes half a dozen may be seen swimming about together. When one of them is shot the others fly up out of the water, but after wheeling once or twice they generally settle round their fallen comrade. They can, if they choose, fly with great rapidity; and I have seen them flying over the swamp where they were breeding with all the rapidity of a Snipe, and suddenly altering the direction of their flight, as that bird is capable of doing. Few, if any, birds float so lightly on the water as the Red-necked Phalarope, where its actions resemble very much those of a Waterhen. It proceeds by a series of short jerks, in a more or less zigzag direction, apparently keeping time by a nod of the head to each stroke of its feet.

Its note, which I have had many opportunities of hearing, is a clear sharp *wick*, very similar to that of the Little Stint and the Sanderling, and having no resemblance at all to the *terrr* of the Dunlin or Temminck's Stint. Saunders appears to have copied Dresser in ascribing the latter note to the Red-necked Phalarope. Dresser appears to have copied Naumann, who admits that he only once met with this species. I am inclined to think that the latter writer, who also evidently refers to the note which I have described, and which he gives as *prip* on the authority of Faber, has wrongly ascribed the Dunlin's note to the Red-necked Phalarope. Audubon describes the note as a sharp clear *tweet, tweet*.

The food of the Red-necked Phalarope is composed of insects, small crustaceans, larvæ, and worms. Much of this food is picked up from the surface of the water, and many insects are caught whilst flying past in the air.

The Red-necked Phalarope breeds on the tundras above the limit of forest-growth, and prefers marshy ground covered with long grass, similar to that frequented by the Reeves. In this long grass it builds its nest, which is a somewhat slight structure of dry stalks, generally placed in the middle of a thick tuft, so that it is not unfrequently a foot or more from the ground. In some places Harvie-Brown and I found the nests of this bird where the grass was short, and in these situations it was scarcely more than a hollow in the ground lined with dead grass. We invariably found the eggs with the small ends pointed inwards, and there was always a lining to the nest.

The Red-necked Phalarope, like the Snow-Bunting, is one of those birds which are not known to breed on the continent south of the Arctic circle, except at some thousand feet above the level of the sea, but which breed in Scotland at no very great elevation, nearly ten degrees further south. My son, who visited the Outer Hebrides last spring, has furnished me with the following particulars of the breeding of this charming bird on the island of North Uist:—

"The Red-necked Phalarope is extremely common in North Uist, but, as far as I know, they are entirely confined to one colony in the north-west of the island. The place chosen by these birds as a breeding-ground is a large marsh about two miles from the sea, one mass of small pools and islands covered with grass. The nests are situated on the edge of the marsh on the dry ground; and although the water was alive with birds during my visit, I did not find a single nest on any of the small islands. The nest is simply a slight depression in the ground, very much like that of a Snipe, containing four eggs. As soon as the birds were disturbed from the nests they flew to the nearest pool of water, where they swam about quite unconcerned, throwing their little heads back, and ever and anon dipping their bills into the water, looking very much like a lot of miniature ducks. They were extremely tame, so much so that a dog we had with us caught several in its mouth. The note is a sharp *tweet, tweet*. They are said to arrive in North Uist about the end of May, leaving again early in the autumn. I visited the colony in the middle of June, and found most of the eggs pretty well incubated. There are also large colonies of Phalaropes breeding in the islands of Benbecula and South Uist."

The eggs of the Red-necked Phalarope are four in number, and vary in ground-colour from pale buff and rich ochraceous buff to pale olive, thickly blotched, spotted, and speckled with rich umber-brown, blackish brown, and pale brown, and with a few greyish underlying markings. Some eggs are much more boldly and richly spotted than others, and on some many of the markings take an oblique direction. The spots are largest and finest round the large end of the egg, sometimes entirely covering it. They vary in length from 1·2 to 1·05 inch, and in breadth from ·85 to ·8 inch. The eggs of this bird resemble very closely those of the Grey Phalarope; the character and colour of the markings are precisely the same, but they may almost invariably be distinguished by their smaller size. Only one brood appears to be reared in the year. It is a noteworthy fact that the male bird performs most, if not all, of the duties of incubation, and tends the young more assiduously than the female. The female is a more showy bird, and would probably be more conspicuous sitting on the nest, or attract by her brilliant tints the numerous enemies to her helpless young.

The adult female Red-necked Phalarope in breeding-plumage has the

entire head as far as the cheeks dull slate-grey; the chin and throat and a spot above and below the eye are pure white; round the neck is a broadish chestnut band, which does not quite meet on the nape; the dull slate-grey of the head extends to the nape and round the lower neck beneath the chestnut band, leaving the rest of the underparts pure white, with a few grey markings on the flanks and under tail-coverts; the rest of the upper parts are dull slate-grey, shading into brown on the wings and tail-feathers, marked with chestnut on the scapulars, broadly tipped with white on the greater wing-coverts, narrowly tipped with white on the innermost secondaries, and broadly barred with white on the upper tail-coverts. Bill black; legs, feet, and claws lead-black; irides dark brown. The colours of the male are less brilliant than those of the female; the chestnut on the neck and scapulars is much duller in colour, and the dull slate-grey on the head and back is replaced by brown, which almost approaches black on the centre of the back and scapulars; there is also a trace of a white eye-stripe over the lores. After the autumn moult the chestnut and grey bands across the neck disappear, as well as the chestnut on the back and scapulars; and all the slate-grey and brown feathers of the upper parts have white edges, which on the head almost obscure the dark bases, except on the upper ear-coverts. Birds of the year differ principally from adults in winter plumage in having the hind head brown and in having traces of chestnut margins to some of the innermost secondaries. Young in first plumage are suffused with brown on the breast, and have the feathers on the forehead, mantle, scapulars, innermost secondaries, upper tail-coverts, and tail dark brown margined with chestnut. Young in down are buffish chestnut on the upper parts and on the throat, mottled with black on the upper parts, and have the underparts below the breast nearly white, and two nearly white stripes down the centre of the back *.

* Dresser's figures of the Grey- and Red-necked Phalaropes "in winter plumage" are not those of adult birds. That of the Grey Phalarope is a bird of the year; that of the Red-necked Phalarope is a young bird in first plumage, which has moulted into the plumage of a bird of the year on the forehead and breast only.

Genus NUMENIUS.

The Curlews were associated by Linnæus with the Godwits and Snipes in his genus *Scolopax*; but in 1790 Latham adopted the genus *Numenius*, which Brisson had established in 1760 in his 'Ornithologia,' v. p. 311. The Common Curlew, *N. arquatus* (being the *Numenius numenius* of Brisson), is the type.

The Curlews have scutellated plates on the front of the tarsus for at least its lower half, but the back of the tarsus is covered with small hexagonal reticulations, the latter character serving to distinguish them from the Sandpipers and Snipes, some of which have a somewhat similar bill. The hind toe is small, and the bill is generally very long and always decurved.

The winter plumage of the Curlews scarcely differs in colour from that of summer. Like most large birds, they secure themselves from danger on the mud-flats by their great wariness, instead of by the assumption of protective colours.

The genus *Numenius* is cosmopolitan, but the species are restricted during the breeding-season to the Palæarctic and Nearctic Regions. It contains about a dozen species, three of which breed in Europe. Only two of these are British, but a third has visited our islands from America.

The Curlews chiefly frequent moors, inland marshes, and uplands during the breeding-season, resorting to the coasts principally during winter or whilst on their migrations. They are very shy and wary, and take wing at the least alarm, flying powerfully and rapidly. During winter they are more or less gregarious, but in spring they disperse in pairs to their breeding-grounds. Upon the ground they walk and run like the other birds in this family. Their notes are loud, clear, wild, and impressive. Their food consists of worms, insects, small mollusks, &c. They make a slight nest on the ground; and their eggs (four in number and somewhat pyriform in shape) are olive-green, spotted with brown and grey.

NUMENIUS ARQUATUS.

COMMON CURLEW.

(Plate 33.)

Numenius numenius, Numenius madagascariensis, *Briss. Orn.* v. pp. 311, 322 (1760).
Scolopax arquata, *Linn. Syst. Nat.* i. p. 242 (1766); **et auctorum plurimorum**—(*Temminck*), (*Schlegel*), (*Naumann*), (*Dresser*), (*Saunders*), &c.
Scolopax madagascariensis (*Briss.*), *Linn. Syst. Nat.* i. p. 242 (1766).
Numenius arquata (*Linn.*), *Lath. Gen. Syn. Suppl.* i. p. 291 (1787).
Numenius major, *Steph. Shaw's Gen. Zool.* xii. pt. i. p. 26 (1824).
Numenius virgatus, *Cuv. Règ. An.* i. p. 521 (1829).

Although the Curlew is found on almost all parts of the coasts of the British Islands in autumn and winter, its breeding-grounds are principally confined to the moors and uplands of the north of England, Scotland, and Ireland. It breeds sparingly in the wild districts of Cornwall and Devonshire, is common on the mountains of Wales, but is never known to nest in the low-lying counties of the east and south of England. Its breeding-range is therefore very similar to that of the Red Grouse and the Ring-Ouzel. It is found on most of the outlying islands, as far north as the Orkneys and Shetlands, as far west as the Outer Hebrides, and in winter as far south as the Channel Islands.

The Curlew breeds much further south than the Whimbrel. It occasionally occurs on the Faroes, and is a summer visitor to the whole of Scandinavia. In the valley of the Obb it is not found further north than the Arctic circle; and in the east it avoids still more carefully the possibility of cold, in Central Siberia only ranging as far north as Dauria, and in Eastern Siberia confining itself to the southern tributaries of the Amoor. Its breeding-range extends throughout Northern and Central Europe, including South Russia. In the basin of the Mediterranean it is principally known as passing through on migration; but a few, probably immature birds, remain throughout the summer, though the statement of Loche that they breed in Algeria cannot be accepted without verification. It occasionally strays as far as the Azores. It passes through Asia Minor, Persia, and Turkestan on migration, and winters throughout Africa, India, the Burma peninsula and the islands of the Malay archipelago. A few remain to winter on the shores of the Mediterranean and the Spanish peninsula.

Asiatic examples of the Curlew are slightly paler, and have, as a rule, whiter rumps and axillaries than European birds. If the eastern form be

regarded as subspecifically distinct, it must bear the name of *Numenius arquatus lineatus**.

On the American continent the Curlew is represented by an allied species, *N. longirostris*, which is connected with it by a somewhat intermediate form, *N. cyanopus*, frequenting the western shores of the Pacific. Both these species may be distinguished by having the rump the same colour as the back.

The summer haunts of the Curlew are the moors and the wild open heaths, not their driest parts, but the extensive swampy flats, where reeds and rushes abound and tufts of cotton-grass relieve the monotony of the surrounding bog. Sometimes the bird frequents the large open wastes near the moorlands that are dignified with the name of mountain-pastures, but its true home is amongst the heath. In winter it quits these upland retreats and repairs to the coast, being especially abundant wherever the shore is low and affords good feeding-ground. It frequents salt-marshes, and loves the wide extensive mud-flats which are left at low water at the mouths of rivers, but is occasionally found on more rocky coasts feeding amongst the seaweed-covered stones or on the small patches of sand. Few birds are more shy than the Curlew; it is wary in the extreme, and rarely allows any one to approach it within gunshot. In summer, when it has retired to the heaths and mountain-marshes, it rises screaming in the air at the least alarm, arousing all its companions in the vicinity, so that soon the whole swamp or heath resounds with their wild impressive cries. The Curlew flies with great quickness, flapping its long wings with regular beats, or sometimes holding them motionless and expanded as it glides along for a few yards ere alighting. The wings are bent at a considerable angle, the neck outstretched, the bill slightly depressed, but the legs are extended straight and show beyond the tail. As a rule, the Curlew flies high; when flushed, it soon mounts into the air, and at times performs various graceful evolutions above its marshy haunts. Upon the ground the Curlew walks about in a solemn Heron-like manner, only occasionally running, as if such a mode of progression were beneath its dignity. It often wades on the little pools on the marsh or sea-shore, and bathes frequently. It is very fond of basking in the sun on some exposed sand-bank, where it can easily detect the approach of danger. It is very seldom that the actions of the Curlew on the ground can be watched in summer, when the bird is in its breeding-haunts; it is so excessively wary that it generally takes wing

* The synonymy of the eastern form is as follows:—
Numenius lineatus, *Cuv. Règ. An.* i. p. 521 (1829).
Numenius nasicus, *Temm. Man. d'Orn.* iv. p. 393 (1840).
Numenius arquatula, *Hodgs. Gray's Zool. Miscell.* p. 86 (1844).
Numenius cassini, *Swinhoe, Ibis*, 1867, p. 398.

long before it is observed, and it resembles so much the colour of its surroundings that it is almost invisible until it takes wing. Its feeding-grounds on the moors are in marshy spots, near the dark-brown peaty pools, where rushes grow so thickly as to hide it from view, or by the side of the little trout-streams that dance and dash along over the heath. Here its actions and mode of progression are very similar to those on the shore: it probes the marshy soil in search of food, and explores the surrounding herbage for a similar purpose; every now and then it raises its long neck above the vegetation, looking warily around, as if scenting danger from afar, ready at the least alarm to fly hastily away to safer quarters. The distant alarm-note of another Curlew puts it on the alert; and generally it rises at once, with startling cries, warning in its turn all its kindred that may happen to be within hearing of its call. In the course of feeding, either on the upland marshes or on the shore, the bill is often thrust for a considerable distance into the ground; and this long bill, ill-adapted as it may seem for the purpose, can readily secure a passing insect, or pick one adroitly from the water or from a grass-stem.

In summer the food of the Curlew is principally composed of worms, insects, and their larvæ; and on the moors the birds vary their diet with the fruit of the whortleberry and crowberry. In winter its food is more varied, and consists of sand-worms, small crustaceans and shells, little crabs, &c. In the stomachs of birds shot at their winter-quarters the shoots of grasses and fragments of leaves have been found. At the nest the Curlew has two perfectly distinct notes or whistles. The well-known *kerr-lee* is the call-note, and the other, which may be expressed as *wiw-i-wiw-i-wiw*, is as unquestionably the alarm-note. It is said that it has a third note, resembling *wha-up*, whence its trivial name of "Whaap"; but this is a note with which I am entirely unacquainted.

Naumann describes the Curlew as passing through North Germany on migration in much greater numbers in autumn than in spring. They migrate both in large and in small flocks, and both during the day and on moonlight nights. The spring migration occurs during April and lasts into May, a few barren birds being even occasionally seen in June. The latter are seen returning as early as the middle of July; birds of the year pass through early in August; whilst the adults are not seen until the latter half of that month. In our islands the Curlews quit the coast at the end of March or beginning of April: the flocks break up in pairs, retire to their inland breeding-places, and scatter themselves over the moors. The eggs are generally deposited in May, and fresh ones may be obtained during that month. In early seasons they are sometimes laid during the last half of April. The nest is usually made on some patch of dry ground, often on a thick tuft of cotton-grass or under the shelter of a little bush or tuft of heather: more rarely it is made on the rough fallow land, beside a large

clod of earth. In these situations Dixon has known the eggs to be broken by the harrow, a nest having been dispensed with altogether. The nest is very slight and shallow and about ten inches across; it consists of a little hollow, either one formed naturally or by the birds themselves, lined with a few bits of herbage, a sprig or two of heath, or a few dead leaves or bits of broken rush. In this simple nest the Curlew deposits her four eggs, which are very large in proportion to the size of the bird. Four is the full complement, but instances have been known where five have been found, one of them being doubtless the produce of another female. They vary in ground-colour from dark or light olive-green to brownish buff, spotted and blotched with olive-brown and dark blackish brown, and with underlying markings of purplish grey. The markings are generally distributed over the entire surface of the shell, but occasionally they form an irregular zone round the large end; and sometimes the spots are few in number, large, bold, and unusually rich in colour. Sometimes a few streaky lines of very dark brown, or a few minute specks of the same colour, are seen amongst the other markings. The eggs vary considerably in shape, some being much rounder than others, but they are usually pyriform; they vary in length from 2·8 to 2·45 inch, and in breadth from 1·95 to 1·75 inch. The only eggs at all likely to be confused with the Curlew's are those of the Whimbrel; but the latter are readily distinguished by their smaller size. Both birds appear to assist in the duties of incubation, but the female performs the greater share. Only one brood is reared in the year; but if the first eggs are taken, others, in many instances, are laid.

When the breeding-grounds of the Curlew are intruded upon, the old birds often show great uneasiness, and are much tamer than at any other time. Sometimes the sitting bird broods closely over her eggs, especially if they are nearly hatched, until the nest is closely approached, when she scurries off through the rank herbage or heath, running for a short distance ere taking wing. Early in the breeding-season, however, the males usually signal the approach of danger to their brooding mates, who at the sound of the warning cry rise from their charge to career wildly about in the air until the cause of their alarm disappears. When the young are hatched both the old birds are very anxious, and often fly closely round an intruder's head.

In autumn, when the young are strong upon the wing, the Curlews again unite in flocks and retire to the coast for the winter: here they frequent the sands and mud-flats at low water, retiring as the tide drives them shorewards to the rocky points, islets, and higher ground, where they wait the falling of the water again. Birds of the year do not breed, and those which have survived the winter and its perils do not leave their winter-quarters. Booth, speaking of the habits of the Curlew on

the Sussex coast, remarks that "their daily routine all the year round consists of half their time on the flats at Goring and the remainder on the shingle-banks. . . . . All through the summer months I have for many years watched these birds in the same locality; there is occasionally in winter a slight increase in their numbers. . . . . The regularity with which this species will make its way to the mud-banks on salt-water estuaries or along the open coast-line as soon as the tide has fallen sufficiently to expose its food is well known to all who have watched the habits of these wary birds." Referring to the latter peculiarity, Sir Ralph Payne-Gallwey remarks:—"They are more regular in repairing to their haunts than any other birds; to the minute they will desert the moors and meadows to leave for the coast. How Curlews can tell from inland fields, far from and out of sight of the tide, the exact moment to make for the shore (as if they carried watches in their pockets) is more than I can even guess at. They will arrive just as the ooze is sufficiently uncovered for them to get their food whilst wading. I have watched them, several miles from the tide, cease feeding, call to one another, collect, and then point for the sea; and this, too, at the very moment I knew the shallows must be nearly exposed. Spring-tides they will hit off exactly, never late, always on the spot just as the banks begin to show." The probable explanation of this regularity is that they keep scouts within sight of the shore to give the main flock notice when the tide is low enough for them to feed.

Though they occasionally feed in company with small Waders, their greater wariness leads them generally to associate together in a flock by themselves. The Curlew passes through the air with great speed at a moderate height, a flock usually flying in the form of the letter V. As they fly along they often change leaders, and if alarmed wheel and turn in the air for some time ere alighting. No bird that frequents the coast is more wary than the Curlew or more clamorous at the approach of danger, rising into the air at once, making such an uproar as to disturb all the wildfowl feeding near, often to the chagrin of the gunner, who mayhap has been patiently stalking them for hours. During the time they are feeding the flock often gets scattered over a considerable area; but when the alarm-note sounds every bird rises at once, the fluttering mass takes shape as the birds fall into their places, and the thin long lines of birds eventually wing their way to safer quarters. Curlews often feed at night, especially if it be moonlight. The flesh of the Curlew is not unpalatable, especially that of the young, and numbers of birds find their way to the markets for food.

The adult male Curlew in breeding-plumage has the general colour of the upper parts pale brown, shading into dull white on the wing-coverts, each feather having a dark brown centre, which on the scapulars and inner-

most secondaries takes the form of obscure bars on the marginal portion. The rump is white; the shortest upper tail-coverts are white, broadly streaked with dark brown, and the longest upper tail-coverts are white, suffused with reddish brown and broadly barred with dark brown; the quills are dark brown with white bars, which on the first five are confined to the outer half of the inner web; the four centre tail-feathers are pale brown barred with dark brown, and the four outer on each side are white barred with dark brown. The underparts are white, suffused with pale brown on the neck and breast, which are broadly streaked with dark brown; the flanks and axillaries are white, more or less irregularly barred and streaked with dark brown, and there are a few faint streaks on the belly and under tail-ceverts. Bill dark brown, paler at the base of the lower mandible; legs, feet, and claws dull slate-grey; irides hazel. The female very closely resembles the male, but has a somewhat longer bill; the centre of the rump is streaked like the upper tail-coverts, and the streaks and bars on the whole of the underparts are more developed. After the autumn moult the streaks on the underparts are narrower, the bars become less conspicuous on the flanks, and often disappear altogether from the axillaries. Young in first plumage closely resemble adults, but the brown of the upper parts is more rufous, the bars on the scapulars and innermost secondaries are more clearly defined, and the black centres of the feathers of the rest of the plumage show a tendency to become bars on the marginal portion, giving to the whole of the upper parts a much more spotted appearance. The underparts are more profusely barred and streaked, especially on the flanks, and the ground-colour of the neck and breast is much more buff and extends to the flanks; but the axillaries are pure unspotted white. Birds of the year are intermediate between adults and young in first plumage, and do not quite assume the fully adult plumage after the first spring moult. Young in down are pale buffish grey, obscurely mottled with dark brown on the upper parts.

NUMENIUS PHÆOPUS.

WHIMBREL.

(Plate 33.)

Numenius minor, *Briss. Orn.* v. p. 317 (1760).
Scolopax phæopus, *Linn. Syst. Nat.* i. p. 243 (1766); **et auctorum plurimorum**—(*Temminck*), (*Gray*), (*Schlegel*), (*Naumann*), (*Dresser*), (*Saunders*), &c.
Numenius phæopus (*Linn.*), *Lath. Gen. Syn. Suppl.* i. p. 291 (1787).
Phæopus arquatus, *Steph. Shaw's Gen. Zool.* xii. pt. i. p. 36, pl. 5 (1824).
Numenius hæsitatus, *Hartl. Orn. W.-Afr.* p. 233 (1857).
Numenius melanorhynchus, *Bonap. Compt. Rend.* xliii. p. 1021 (1856).

So far as is known, the only breeding-places of the Whimbrel in the British Islands are in the Orkneys and Shetlands and in several parts of the north of Sutherlandshire, though it is far from improbable that it may breed on some of the wildest and most isolated of the islands on the west coast of Scotland. There is no reliable evidence of this bird ever having bred in England or Ireland. At the seasons of migration it is generally distributed on all the British coasts, being apparently more numerous in spring than in autumn; a few remain on the low-lying coasts all the winter, and a few immature birds lag behind in spring.

The Whimbrel breeds in the Arctic regions of Europe and Asia, from Scandinavia to Kamtschatka, but, like the Grey Plover, it appears to be very local. It is not uncommon during the breeding-season in the extreme north of Norway and on the southern fells. Hencke says that it is a rare summer visitor to Archangel; Harvie-Brown and I found it rare in the valley of the Petchora; Finsch did not meet with it in the valley of the Obb, neither did Dr. Theel nor I meet with it in the valley of the Yenesay. Middendorff did not meet with it in travelling from the Taimur peninsula to the sea of Ochotsk; and the only authorities for its occurrence in Siberia appear to be Radde, Dybowsky, and Gmelin, who observed it passing through Dauria on migration, and Steller, who records it from Kamtschatka. It appears to be most common in Iceland and the Faroes. It passes through the rest of Europe and North Africa on migration, wintering throughout Africa. The eastern birds pass through Japan and China on migration, and winter throughout the Oriental and Australian Regions, except the most remote of the Pacific islands. Most ornithologists regard the eastern form of the Whimbrel as distinguishable from the western form. Eastern birds have always longitudinal streaks on the rump, a character which is only found in the young of the western race, and then never to the same extent as in the adult of the eastern birds.

The eastern form is probably only subspecifically distinct, and should bear the name of *Numenius phæopus variegatus* *. A distinct species, *N. tenuirostris*, breeds in the basin of the Mediterranean and winters in Africa; it may be distinguished by its white instead of barred axillaries, by the absence of the pale mesial line on the crown, in which respect it resembles the Curlew, and by having the ground-colour of the tail white barred with dark brown. The Whimbrel is represented on the American continent by an allied species, *N. hudsonicus*, and in the Pacific islands by a somewhat more distantly allied species, *N. tahitiensis*, both of which principally differ in having the axillaries and under wing-coverts pale chestnut, barred with dark brown, and in having the rump coloured like the back.

In many of its habits the Whimbrel very closely resembles the Curlew. In its journey northwards to its breeding-grounds it crosses the Mediterranean both at Gibraltar and in the Levant in April, and arrives on our coasts about the 1st of May. So regular is it in its migrations that in many parts of the British Islands it is known as the "May bird." In August flocks of young birds make their appearance, the old birds arriving a little later. Most of these Whimbrels leave our shores before the end of September, recrossing the Mediterranean in September and October. The Whimbrel generally migrates during the night in flocks, sometimes containing several hundred birds. They chiefly frequent the low-lying coasts, searching the mud-banks and marshes for food, but they also feed on pastures near the sea, as well as on the grass-covered "saltings." Upon their arrival they are far from shy, presenting in this respect a marked contrast to the Curlew; but incessant persecution soon teaches them a lesson and increases their wariness. They seldom run, preferring to walk sedately and slowly with heads bent downwards in eager search for food. When alarmed they stretch themselves to their full height, look anxiously around, and then hurriedly take wing, or if satisfied of their safety begin to feed again. When in the air they very closely resemble the Curlew, but they fly quicker and often much closer to the ground. The wings are moved with rapid beats, and just before alighting the bird often holds them bent downwards and outspread, and skims along for some distance. The flock often keeps up a chorus of anxious cries, a clear shrill whistle several times repeated. They fly at an immense height, especially when on migration, their peculiar call sounding faint overhead being often the only sign of their presence.

The Whimbrel is not so exclusively a shore-feeder as the Curlew. It loves

* The synonymy of the eastern form is as follows:—
Tantalus variegatus, *Scop. Del. Fl. Faun. Ins.* ii. p. 92 (1786, *ex Sonnerat*).
Numenius luzoniensis, *Gmel. Syst. Nat.* i. p. 656 (1788, *ex Sonnerat*).
Numenius atricapillus, *Vieill. N. Dict. d'Hist. Nat.* viii. p. 303 (1817, *ex Sonnerat*).
Numenius uropygialis, *Gould, Proc. Zool. Soc.* 1840, p. 175.

to haunt the marshy pastures near the sea, and run round the pools which have been left in them by the tide, often wading through the shallows for a considerable distance. Mr. Cordeaux remarks that they are very fond of bathing, splashing the water over their bodies as they stand breast-deep in the tide, and then standing fanning their wings and drying their plumage. They have occasionally been observed to swim. The food of the Whimbrel, whilst the bird stays on our coasts, consists of sand-worms, insects and their larvæ, beetles, and small marine animals, especially crustaceans. It is also very fond of small land-shells, which it picks up from the pastures, and in summer it is said to eat moor fruits and berries.

The favourite breeding-grounds of the Whimbrel are the moors and heaths in close proximity to the sea. When the vicinity of their nest is intruded upon the Whimbrels fly into the air and circle round and round. The nest is very slight, a little hollow amongst the heath, or under the shelter of a tuft of coarse grass, in a dry part of the swamp, and is lined with a few scraps of dry herbage. The eggs are usually laid at the end of May, and from that date they may be obtained until the end of June. They are four in number when the full complement is laid, and are very similar to those of the Curlew. They are olive-green of different shades or pale brownish buff in ground-colour, spotted and blotched with olive-brown or reddish brown, and with grey underlying markings. On some eggs most of the spots take the form of an irregular zone round the large end, on others they are evenly distributed over the entire surface; whilst some are only sparingly marked with large blotches and tiny specks. They vary in length from 2·5 to 2·2 inch, and in breadth from 1·75 to 1·6 inch. In actual *bulk* the eggs of the Whimbrel are always smaller than those of the Curlew. It is almost impossible to distinguish certain eggs of the Whimbrel from some eggs of Richardson's Skua; but as a rule those of the latter bird are smaller and not so pointed at the small end. The Whimbrel only rears one brood in the year. Captain Feilden, who obtained many nests of this bird on the Faroes, says that it is very pugnacious in the breeding-season, and is ever ready to beat off intruding birds from its particular haunt. He watched them repeatedly chasing the Lesser Black-backed Gull in arrow-like flight from the vicinity of their nests, all the time keeping up incessant cries. At their breeding-grounds they occasionally perch on trees and stakes. The call-note of the Whimbrel and its note of alarm at the nest are so similar to those of the Curlew that they do not require repetition, but they are not quite so loud and are in a somewhat higher key.

As soon as the young can fly the southward migration begins, the young birds migrating before their parents. These autumn flights of Whimbrels often take a different route towards the south from that taken in spring, and it has been observed in many localities that the flocks are

smaller. Mr. Cordeaux states that in the Humber district few birds alight there in autumn, the greater number passing on without stopping. This bird does not appear to associate much with other species; but a solitary bird will often join a flock of Dunlins or Curlews.

The Whimbrel is a much smaller bird than the Curlew. The difference between the plumages of male and female and of summer and winter are so slight in the Whimbrel that they are difficult to detect. The adult in summer plumage has the general colour of the feathers of the upper parts almost the same as in the Curlew; but the pale margins and bars are greyer and much more obscurely defined. The wings, rump, and upper tail-coverts closely resemble those of the Curlew, but the crown is quite differently coloured; instead of being pale brown uniformly streaked with dark brown, it is a nearly uniform dark brown, which contrasts strongly with the nearly white eye-stripes and mesial line; and all the tail-feathers are pale brown barred with dark brown. The underparts scarcely differ from those of the Curlew, except that the bars on the thighs are more conspicuous and the axillaries are more profusely barred. Bill dark brown, paler at the base of the lower mandible; legs, feet, and claws dull slate-grey; irides hazel. Young in first plumage are much more distinct from adults in colour than those of the Curlew. The feathers of the mantle, the scapulars, and the innermost secondaries are dark brown, spotted on their margins with buff; the ground-colour of the wing-coverts is buff instead of white, and the rump is more or less distinctly streaked. Very little difference is noticeable on the underparts, except that the axillaries are not so broadly barred. It is not known whether the young in first plumage change any of their feathers before their first spring moult, after which they only differ from adults in having the general colour of the upper parts not quite so grey, and in having the bars on the scapulars and innermost secondaries not quite so obscure. Young in down very closely resemble those of the Curlew.

NUMENIUS BOREALIS.

ESQUIMAUX CURLEW.

(Plate 33.)

Scolopax borealis, *Forst. Phil. Trans.* lxii. pp. 411, 431 (1772); **et auctorum plurimorum** (*Latham*), (*Swainson & Richardson*), (*Audubon*), (*Baird*), (*Coues*), &c.
Numenius borealis (*Forst.*), *Lath. Ind. Orn.* ii. p. 712 (1790).
Numenius brevirostris, *Licht. Verz. Doubl.* p. 75 (1823).
Numenius microrhynchus, *Philippi & Landb. Wiegm. Arch.* 1866, p. 129.

Six occurrences in the British Islands of the Esquimaux Curlew have been recorded. The first example, apparently a bird in first plumage, was killed on the 6th of September, 1855, on one of the Grampians, a few miles from Aberdeen, by Mr. W. R. Cusack Smith (Longmuir, 'Naturalist,' 1855, p. 265); a second was obtained some years previous to 1870 on the river Alde near Aldeburgh in Suffolk, but was not preserved; and a third was killed near Woodbridge in the same county (Hele, 'Notes about Aldeburgh,' p. 177). The fourth example was shot in Sligo, and purchased in the Dublin market on the 21st of October, 1870 (Blake-Knox, 'Zoologist,' 1870, p. 2408); it was exhibited at a meeting of the Zoological Society in London by Sir Victor Brooke, into whose collection it passed (Proc. Zool. Soc. 1871, p. 299). The fifth bird (a male) was shot by Mr. Ramsay, of Staines, in Aberdeenshire, on the 29th of September 1878, and was exhibited by Mr. Harvie-Brown at a meeting of the Natural-History Society of Glasgow (Harting, 'Zoologist,' 1879, p. 135). The sixth, an adult male, was shot in the forest of Birse, Kincardineshire, on the 21st of September 1880 (Harvie-Brown, 'Zoologist,' 1880, p. 485).

The Esquimaux Curlew has never occurred on the continent of Europe, being a strictly Nearctic species, breeding on the American tundras above the limit of forest-growth, and occasionally crossing to the Siberian side of Behring's Straits. It passes through the United States and Central America on migration, but appears to confine itself to the Atlantic side of the Rocky Mountains. It winters throughout South America below the Equator. It has occurred twice in Greenland, and passes the Bermudas regularly on migration in considerable numbers, whence the few individuals that have been obtained in our country have probably been driven out of their course by storms. The Esquimaux Curlew is represented in East Siberia, China, and Japan by *Numenius minutus*, which may always be recognized by its smaller size—the wing measuring $7\frac{3}{4}$ inches or less,

instead of $8\frac{1}{4}$ inches or more. The underparts, especially the under tail-coverts, are less spotted and the tarsus is longer in the smaller species.

The Esquimaux Curlew passes through the United States on its way northwards in immense flocks during May. At the beginning of the month they make their appearance, scattering themselves over the prairies as well as the coast, even when the snow is lying thickly. The return migration from the breeding-grounds in the Arctic tundras commences by the end of July or the beginning of August, and lasts until the end of October. On its return southward it seems to prefer the coasts to the inland districts. It frequents large salt-marshes and mud-flats on its annual journey from the north. It is described as being a very shy bird, and rarely allows any one to approach it closely, unless it is skilfully stalked as it is feeding in company with other Waders. Its flight is performed very rapidly, sometimes at a considerable height. If one out of a flock is wounded its companions hover above it, and fly round and round, losing their accustomed wariness in their anxiety for its fate. When in the air they do not usually fly in a compact flock, but in a scattered manner. When about to alight their wings are often held motionless and curved downwards, as they sail along for a short distance ere dropping on the ground. As soon as they alight their long wings are raised over the back and then gracefully folded. Coues describes their note as an oft-repeated soft mellow whistle; but when they are in large flocks they keep up an incessant chorus of chattering cries, and when wounded they utter a harsh scream.

The Esquimaux Curlew seems much attached to its feeding-grounds, although it may be often disturbed; and Coues relates an instance of a flock of birds that, in spite of continued firing, could not be driven from a mud-flat which abounded with their favourite food. The food of this bird seems to be principally composed in summer of crowberries, and probably other Arctic fruits are eaten. It is also extremely fond of a small mollusk which is found on rocks and amongst seaweed; and in winter other small marine animals are doubtless eaten. Crowberries were found in the stomachs of the two last-mentioned British examples, and in one of them were also a caterpillar and some small flies. Audubon observed the Esquimaux Curlew feeding on these berries in Labrador, and states that the flocks alighted, sometimes after performing various evolutions in the air, and that each bird ran quickly along, all in the same direction, picking up the berries as they went. When pursued they crouched close to the ground to try and escape detection; but if flushed they would all rise, and after flying about some time again alight, often in the same place as before.

The Esquimaux Curlew breeds in the Arctic regions. It is known to nest in great numbers near the Anderson River. Its breeding-season begins towards the end of June, when the snow has melted, and the Arctic

regions are gay with flowers and abounding with birds. It is said to breed on the open plain or tundra, and its nest is very slight, consisting of a little hollow in the ground, lined with a few bits of dry herbage or one or two withered leaves and bents. In this scanty cradle the female deposits four eggs; but Richardson once observed a female sitting on three. I have figured an egg of this bird which is in the collection of my friend Mr. Crowley; it is pale olivaceous buff in ground-colour, spotted and blotched with light and dark brown, and with faint underlying markings of greyish brown. In the series of eggs collected by MacFarlane near the Anderson River, and now in the collection of the Smithsonian Institution at Washington, the ground-colour varies from greyish buff to greenish olive on the one hand and to buffish brown on the other. The overlying spots are dark reddish brown, sometimes small, but generally bold, and are usually most abundant, often confluent, round the large end of the egg; the underlying markings, generally conspicuous, are pale greyish brown. The eggs are pyriform in shape, and vary in length from 2·12 to 1·9 inch, and in breadth from 1·5 to 1·33 inch.

The Esquimaux Curlew slightly resembles the Whimbrel, but is only about half the weight, each measurement being about a sixth less. The differences of plumage attributable to sex are unimportant, and those dependent on season are principally confined to the abrasion of the feathers in late summer and late winter. The upper parts of the adult are dark brown, streaked with buff on the head, neck, and wing-coverts; spotted with the same colour on the back, scapulars, and rump; imperfectly barred on the innermost secondaries, and completely barred on the upper tail-coverts and tail. The underparts are pale chestnut-buff, unmarked on the upper throat and the centre of the belly; streaked with brown on the lower throat, and with arrow-shaped markings of the same colour on the breast, flanks, under tail-coverts, and under wing-coverts. The axillaries are pale chestnut, barred with brown. Bill dark brown, paler at the base of the under mandible; legs and feet olive; claws black; irides hazel. Young in first plumage differ in having the feathers of the back, rump, scapulars, and innermost secondaries dark brown, with narrow pale buff margins, and in having almost unspotted under tail-coverts. Young in down appear to be undescribed.

The Esquimaux Curlew can never be mistaken for the Whimbrel. In addition to its smaller size, the absence of the white on the lower back and rump distinguishes it in a moment; the eye-stripes and the mesial line on the crown are also much less distinct than in the Whimbrel.

Genus TOTANUS.

The Hard-billed Sandpipers were not separated by Linnæus from the genus *Tringa*; but in 1803 Bechstein, in his 'Ornithologisches Taschenbuch,' ii. p. 282, established the genus *Totanus* for their reception. The Redshank, *T. calidris* (being the *Scolopax totanus* of the tenth * edition of the 'Systema Naturæ,' and the *Tringa totanus* of Brisson), has every claim to be regarded as the type.

There are about fifty Sandpipers known, which may be generically separated as follows :—

Outer and middle toes united by a membrane at the base.....	*Totanus.*	
	Ereunetes.	End of the bill covered by a soft membrane.
	Tringa.	
Hind toe absent	*Calidris.*	
	Tringites.	

Modern ornithologists have distributed these fifty species amongst no fewer than twenty-one genera. This seems to me absurd; the characters upon which these genera are founded are pitched so low, that the object for which a binomial nomenclature was invented is practically defeated. The characters which I have selected may not be important, but it is impossible to prove that any others which have been chosen are not less so.

The hard-billed and partially web-footed Sandpipers comprised in the genus *Totanus* have the tarsus scutellated before and behind, though in two Pacific-coast species the scutellations at the back of the tarsus are confined to a small portion of the upper half. In most of the species the tail is barred, but in three or four the feathers are almost, if not quite, uniform.

* The *Scolopax totanus* of the twelfth edition of Linnæus is most probably the Greenshank; but it is impossible to say with certainty. The diagnosis is vague; no reference is made to the 'Fauna Suecica,' and of those given, some refer to a bird with the bill turned up, and others to a species with the bill turned down.

The genus *Totanus* is cosmopolitan, if we accept the winter distribution as part of its range; but as it is obvious that only the breeding-range should be regarded, it may be said to be confined to the Arctic, Palæarctic, and Nearctic Regions. It contains about five and twenty species, of which about a dozen breed in Europe; but the British list contains thirteen, in consequence of the admission into it of several stragglers from the American continent.

The birds in this genus chiefly frequent inland moors and marshes during the breeding-season, only visiting the coasts in winter or during migration. They are more or less gregarious or sociable in winter, but separate into pairs during summer. They run and walk with ease, often wade, and fly powerfully and with great speed. Their food is principally composed of insects, mollusks, &c. Their notes are loud and not unmusical, and in the pairing-season almost amount to a song, which is generally uttered whilst the bird is performing evolutions in the air. Their nests are slight and generally placed on the ground, usually near water; and their eggs, four in number, are very pyriform, more or less handsomely spotted, like those of the birds in the allied genera.

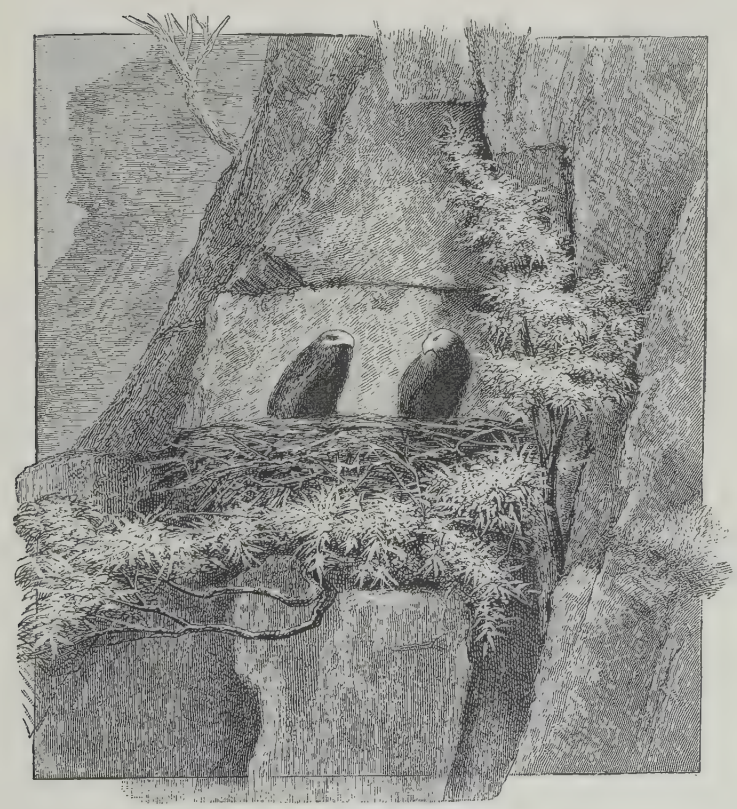
The following artificial key to those species of the genus *Totanus* which are included in the British list will enable the student to name any one of the hard-billed, partially web-footed, Sandpipers in any plumage :—

A. Rump and upper tail-coverts nearly the same colour as the back.
  a. Primaries and secondaries brown, barred with white ..... T. BARTRAMI.
  b. Primaries and secondaries uniform brown.
    a^1. Wing over $6\frac{1}{2}$ inches long ..... T. PUGNAX.
    b^1. Wing less than $5\frac{1}{2}$ inches long ..... T. SOLITARIUS.
  c. Primaries uniform; secondaries brown, with white bases and tips.
    c^1. Brown on the secondaries, from the fifth to the tenth, covering more than half of the feather ..... T. HYPOLEUCUS.
    d^1. Brown on the secondaries, from the fifth to the tenth, covering less than half of the feather..... T. MACULARIUS.

B. A white band across the wings or upper tail-coverts.
  d. Bill less than $2\frac{1}{2}$ inches long; frontal feathers extending beyond the angle of the gape; lateral groove of the maxilla extending scarcely more than halfway to the end of the bill.
    e^1. Upper and lower back concolorous; wing less than $6\frac{1}{2}$ inches long.
      a^2. Axillaries and under wing-coverts brown, narrowly barred with white ..... T. OCHROPUS.
      b^2. Axillaries and under wing-coverts white, slightly mottled with brown.
        a^3. Tarsus brown, about $1\frac{1}{2}$ inch long ..... T. GLAREOLA.
        b^3. Tarsus yellow, about 2 inches long ..... T. FLAVIPES.

f^1. Lower back nearly white, in strong contrast to the upper back; wing more than 7 inches long.
- c^2. Secondaries white ..... T. CALIDRIS.
- d^2. Secondaries white, barred with brown ..... T. FUSCUS.
- e^2. Secondaries uniform brown..... T. GLOTTIS.

e. Bill more than $3\frac{1}{2}$ inches long; frontal feathers not extending beyond the angle of the gape; lateral groove of maxilla extending nearly to the end of the bill.
- g^1. Lower back nearly white, in strong contrast to the upper back ..... T. RUFUS.
- h^1. Lower back concolorous with the upper back ..... T. MELANURUS.



EAGLE'S NEST IN SUTHERLANDSHIRE.

TOTANUS BARTRAMI.

BARTRAM'S SANDPIPER.

(Plate 32.)

Tringa longicauda, *Bechst. Kurze Uebersicht*, p. 453 (1811).

Tringa bartramia, *Wils. Am. Orn.* vii. p. 63, pl. 59. fig. 2 (1813); **et auctorum plurimorum** — *Audubon*, *Nuttall*, (*Temminck*), (*Naumann*), (*Bonaparte*), (*Swainson & Richardson*), (*Coues*), (*Allen*), (*Lawrence*), (*Sclater*), (*Dall & Bannister*), (*Harting*), (*Salvin*), (*Ridgway*), (*Gray*), (*Dresser*), (*Pelzeln*), (*Schlegel*), &c.

Totanus variegatus, } *Vieill. N. Dict. d'Hist. Nat.* vi. pp. 397, 401 (1816).
Totanus melanopygius, }

Totanus bartramia (*Wils.*), *Temm. Man. d'Orn.* ii. p. 650 (1820).

Bartramia laticauda, *Less. Traité d'Orn.* p. 553 (1831).

Actitis bartrami (*Wils.*), *Naum. Vög. Deutschl.* viii. p. 43 (1836).

Actiturus bartramius (*Wils.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 51 (1838).

Tringoides bartramius (*Wils.*), *Gray, Gen. B.* iii. p. 574 (1846).

Bartramius longicaudus (*Bechst.*), *Bonap. Rev. et Mag. Zool.* 2nd series, ix. p. 59 (1857).

Actiturus longicaudus (*Bechst.*), *Newt. List B. Eur. Blasius*, p. 18 (1862).

Bartram's Sandpiper was first recorded as a British bird from a specimen which was shot near Warwick in October 1851 (Reid, 'Zoologist,' 1852, p. 3330; J. H. Gurney, 'Zoologist,' 1852, p. 3388; and More, 'Zoologist,' 1854, p. 4254). The second example was shot on the 12th of December, 1855, in a field between Cambridge and Newmarket (Tearle, 'Illustrated News,' January 20th, 1855). A third specimen was obtained near Mullion, in Cornwall, and was sent to a game-dealer at Falmouth, in November 1865 (Bullmore, 'Zoologist,' 1866, p. 37). A fourth specimen was discovered in the collection of Dr. Woodforde, which was said to have been shot, at least thirty years previously, on the banks of the river Parret, in Somersetshire (Murray A. Mathew, 'Zoologist,' 1877, p. 389). A fifth was shot on the 21st of November, 1879, on the sea-banks at Lowhoughton Low Stead, in Northumberland (Bolam, 'Field,' 20th Dec., 1879). A sixth, said to have come from Lincolnshire, was purchased in Leadenhall Market on the 27th of October, 1880, and brought to Mr. Harting, who recorded it ('Zoologist,' 1880, p. 508). A seventh was killed at St. Keverne, near the Lizard, in Cornwall, in October 1883 (Cornish, 'Zoologist,' 1883, p. 495). No examples of this bird have yet been recorded from Scotland or Ireland.

Bartram's Sandpiper breeds in the southern provinces of British North America and in the northern portion of the United States. It migrates southwards on the approach of winter in great numbers, both on the

Atlantic coast and along the inland "fly-lines," wintering in the Southern States, Mexico, the West Indies, Central America, and in South America, at least as far as Peru and Brazil. It is possible that its breeding-range may extend much further north, as it has been obtained nearly as far north as the Arctic circle in Alaska. It appears occasionally to wander very far from its ordinary winter-quarters during migration. There is no record of its occurrence on the Pacific coast of North America; but it has been obtained on the Bermuda Islands, in Australia, and in Italy, Malta, Holland, and Germany.

Bartram's Sandpiper leaves its winter-quarters and migrates to its breeding-grounds early in spring. Although many of the birds pass along the coast northwards, the great line of migration seems to be across the boundless prairies lying between the Mississippi and the Rocky Mountains: on these endless grassy plains the "Prairie-Pigeon," as this bird is locally called, occurs in countless numbers during April and May. On the prairies of Northern Dakota Bartram's Sandpiper is the commonest of the Waders. At the end of May those birds which are going to breed further north take their departure, for the snow will have melted by the time they arrive, and those that linger prepare for their nesting-duties. Bartram's Sandpiper is very tame, and runs along the roadside within a few yards of the traveller, or stands quietly amongst the prairie-grass, allowing him to pass it quite closely.

Coues says that in Northern Dakota the eggs are laid by the second week in June, and that only one brood is reared in the year. The nest is very difficult to find, sometimes placed amongst the sun-dried scanty herbage on the open prairie, but more generally near to small pools and swamps or near the border of a wood in an open spot. The nest is very slight—a small depression in the ground, carelessly lined with a few straws or bits of herbage, being all the provision that is made. The eggs are always four in number when the full complement is laid. They vary in ground-colour from pale greyish buff to pale buffish brown, rather sparingly spotted and blotched with reddish brown and with grey underlying markings. Some eggs have a few delicate streaks of brown at the large end. The markings are never very large, varying from the size of a pea to a mere speck; the spots are largest and most numerous round the large end. The eggs vary in length from 1·9 to 1·68 inch, and in breadth from 1·35 to 1·25 inch. The eggs of Bartram's Sandpiper are very similar in general appearance to those of the Common and Green Sandpipers, but may always be distinguished by their larger size.

The female is a very close sitter, often allowing herself to be nearly trodden upon before she quits her charge, and will then in many cases feign lameness, especially if incubation is well advanced. Several pairs of birds often

breed very close together, so that when one pair is alarmed the others soon join in the general clamour. The young are hatched late in June or early in July, and when menaced by danger hide themselves by crouching close to the ground. In the late summer, when the young broods are in company with their parents, many birds may be found in a suitable part of the prairie, and as the season advances the flocks become larger. They are said to leave their breeding-grounds early in autumn, and Coues saw none in Northern Dakota after the beginning of September. The flight of Bartram's Sandpiper is rapid and well sustained, and it is said that it usually performs its migration at night. In the breeding-season, and especially when the birds are about pairing, it perches on trees, stumps, or posts, elevating its pointed wings and uttering its long-drawn note. The ordinary note of Bartram's Sandpiper is a soft mellow whistle; besides this, Coues states that it has a prolonged cry, which sounds more like the whistling of the wind than the voice of a bird, and which is peculiar to the breeding-season: this note is often heard at night. It has also another note, a harsh scream often repeated, which it utters when disturbed at the nest.

The food of Bartram's Sandpiper is largely composed of insects, especially grasshoppers, beetles, and crickets. This fare is varied by worms, small snails, shoots of plants, and wild fruits, especially strawberries, and small berries and seeds of various kinds. In autumn the birds are very fat; indeed they are always in fair condition, and their flesh is prized as an article of food. In winter they keep in large flocks, but often associate in only small parties.

Bartram's Sandpiper is a very peculiar bird. In size and general appearance it closely resembles a Reeve; but the quills and tail-feathers are all more or less distinctly barred, slightly resembling those of the Buff-breasted Sandpiper. In the adult in summer plumage of both sexes the feathers of the lower back and rump are uniform dark brown, those of the head, neck, upper back, and scapulars brown, margined with buff; whilst the wing-coverts, innermost secondaries, upper tail-coverts, and tail-feathers are buff, irregularly barred with black. The underparts are buff, shading to white on the chin, belly, axillaries, and under wing-coverts, streaked on the neck, and barred on the breast, flanks, axillaries, and longest under tail-coverts, with dark brown. Base of bill, legs, and feet buff; point of bill and claws dark brown; irides hazel. After the autumn moult the buff margins of the feathers of the upper parts are more conspicuous, and the breast is not barred, but obscurely streaked. Young in first plumage resemble adults in autumn plumage, but the margins of the feathers of the upper parts are a darker buff, and the spots on the throat and breast are much less distinct. Young in down are buff, marbled with black, and dusted with white on the upper parts, but are nearly pure white on the underparts.

TOTANUS PUGNAX.

RUFF.

(Plate 29.)

Tringa totanus cinereus, *Briss. Orn.* v. p. 203 (1760).
Tringa pugnax, *Briss. Orn.* v. p. 240 (1760); *Linn. Syst. Nat.* i. p. 247 (1766); **et auctorum plurimorum**—(*Naumann*), (*Temminck*), (*Dresser*), (*Saunders*), &c.
Tringa littorea, *Linn. Syst. Nat.* i. p. 251 (1766).
Tringa grenovicensis, *Lath. Gen. Syn. Suppl.* i. p. 293 (1787).
Pavoncella pugnax (*Linn.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 29 (1816).
Totanus pugnax (*Linn.*), *Nilss. Orn. Suec.* ii. p. 71 (1817).
Machetes pugnax (*Linn.*), *Cuv. Règ. An.* i. p. 490 (1817).
Totanus indica, Limosa hardwickii, } *Gray, Ill. Ind. Zool.* ii. pl. 52. figs. 1, 2 (1834).
Philomachus pugnax (*Linn.*), *Gray, List Gen. B.* p. 89 (1841).
Machetes optatus, *Hodgs. Gray's Zool. Miscell.* p. 86 (1844).

The Ruff is a rare summer migrant to the British Islands, a few pairs still occasionally breeding in the Norfolk broads; but it is more abundant on spring and autumn migration. Formerly it bred in great numbers in most of the marshy districts of England, from Northumberland southwards. In Scotland and Ireland it occurs regularly on migration, and it is occasionally seen on the Orkney and Shetland Islands.

The Ruff is a west Palæarctic species, breeding as far north as land extends, as far south as the valley of the Danube and the Kirghiz Steppes, and as far east as the Taimur peninsula and West Dauria, where it reaches to and probably breeds in the upper valley of the Amoor. It passes through the basins of the Mediterranean, Black, Caspian, and Aral seas on migration, and winters in suitable localities through Africa, Northern India, and Burma. Like many other Waders, it occasionally straggles far and wide during winter. A single example has occurred in Ceylon, and another on the north island of Japan, whilst others have been obtained in the United States of America (Maine, Massachusetts, New York, and Ohio) and in Spanish Guiana. Pallas says that it was not rare in Kamtschatka, but subsequent travellers have failed to meet with it. The Ruff has no near ally.

The Ruff reaches its breeding-grounds somewhat late in spring. Naumann says that in Germany the males arrive during the first half of May, and the females during the second half of that month; that the males leave in August, but the females and young not until September. At Valconswaard I saw the first flock of males on the 13th of May; but we took three nests on the 20th and 21st, one of them a full clutch, so that

they apparently begin to breed soon after their arrival. Irby says that they pass the Straits of Gibraltar from January to the end of May, the later flocks being doubtless those breeding in the high north. On the Arctic circle, in the valley of the Petchora, Harvie-Brown and I saw the first Ruff on the 30th of May, and took the first nest on the 12th of June. In the same latitude, in the valley of the Yenesay, the Ruff arrived on the 9th of June, and eggs were taken four degrees further north on the 1st of July.

There are two points of special interest attaching to the history of the Ruff, which are probably intimately connected with each other. One of these is the extraordinary variety of the plumage of the males in the breeding-season, and the other is the fact that the Ruff is polygamous. It is said that the females largely outnumber the males. Naumann estimates the proportion at three to one, and this discrepancy is confirmed by African collectors. The males contend in single combat for the right of being "cock of the walk;" and for this purpose battlefields are chosen, like the "laking-places" of the Capercaillie and the Blackcock. These are sometimes on a slight elevation, but usually are nothing more than a spot of open ground in the marsh where a patch of level short grass is to be found, four or five feet across, and so situated that it may be exposed to the view of the admiring females. The same piece of ground is chosen year after year, and Naumann mentions an instance of one which had been thus used for half a century. Frequently two or three duels are going on at once on the ground, but they seldom last long. After what looks like furious sparring, the weaker cock retires from the "hill," seldom any worse for the fray, and the conqueror awaits another foe. These cock-fights are not commenced until the ruff or collar is fully grown, which is seldom before the middle of May, and are discontinued as soon as the feathers on the neck begin to fall out, which happens about six weeks later. Soon after sunrise is the best time to observe them, but I have watched them in Russia and in Holland as late as eleven in the forenoon. The excitement of the birds is intense; they stoop with their heads low and their ruffs expanded, and fly at each other like game-cocks, but, unlike those birds, they fight with the bill and not with the foot. The warts on the side of the face of the Ruff only remain during the spring, and doubtless serve as a protection against the sword-thrusts of their adversaries.

Except during the month or so when the males "hill," the Ruff is not very gregarious at its breeding-grounds; solitary birds are often seen, but three or four together is not unusual. No bird is more conspicuous than the Ruff during the breeding-season. It frequents for the most part the swampy portion of the moors, where its divers gay colours contrast strongly with the light green of the wet grass, and where there is little or no cover. Even in places where the moors are close to the sea, it does not feed on

the sands, and seldom frequents the mud-flats, but prefers to feed in fresh water, where it picks up worms, slugs, and insects of all kinds.

After the male has lost his ruff he appears also to lose all interest in his Reeves, and to take no part in the care of the family. The Reeve alone builds the slight nest, incubates the eggs, and takes care of the young. The nest is on the ground, in the middle of a swamp, where you have to splash through the water amongst rushes, sedge, and coarse grass, in the midst of a clump of which a depression is found, and roughly lined with dead grass and sedge. The nest is very difficult to find, but the bird sits close and reveals her treasures as she flies away. Both the Ruff and the Reeve are very silent birds; I have never heard them utter a note, but on migration they are said to have a low call-note, like the *wick* of the Sanderling, Phalarope, and Little Stint.

The eggs, in a full clutch always four in number, are somewhat similar to those of the Great Snipe, indeed some are absolutely indistinguishable from them; but as a rule they are smaller and greener. The ground-colour varies from an almost neutral pale grey to pale greenish grey; the overlying spots are reddish brown, and the underlying spots pale greyish brown. The spots are not quite so bold as those on the eggs of the Great Snipe, but they are equal in size to those on most Sandpiper's eggs, and are occasionally confluent at the large end. The eggs vary in length from 1·8 to 1·6 inch, and in breadth from 1·3 to 1·15 inch.

In its winter-quarters the Ruff is a very gregarious bird: Jerdon says that these birds assemble in vast flocks in India during the cold season and feed greedily on rice. In South Africa it is described as occurring both in large and small flocks during our winter. In Natal, Ayres says that the flocks feed on the mud-banks at low water, marine insects appearing to be their favourite food; but in Damara Land, Andersson says that it is generally observed in the rainy season in small flocks of from three to a dozen individuals, only one or two of which are males, and he adds that it is rarely seen on the coast, being chiefly found inland, feeding on insects and worms.

There are an infinite number of variations in the colour of the plumage of the male Ruff; but these may be reduced to thirty-three typical ones, the remainder being to all appearance intermediate forms or crosses. The variation of colour is, however, very small, being confined to three typical colours—white, chestnut, and black with metallic blue or green reflections. The parts which vary in colour are—first, the ruff; second, the breast and flanks; and third, the ground-colour of the upper parts. Each of these may be of either of the three colours named, except that the breast and flanks do not appear ever to assume a white hue; but the ruff when black may be barred with either white or chestnut. The parts that are nearly constant in colour are:—the quills, lesser wing-coverts, and primary-coverts,

which are nearly uniform brown; the lower back, which is nearly black, with chestnut margins to the feathers (though this part is generally in the plumage of winter); the under wing-coverts, axillaries, the centre of the belly, and under tail-coverts, which are pure white; and the tail, which is brown, a few of the centre feathers being more or less obscurely barred with dark brown. The feathers of the upper parts are spotted, barred, or vermiculated with dark brown, except on the head and hind neck. The face during the breeding-season is covered with yellowish tubercles. Bill yellowish orange, darker at the tip; legs and feet yellowish brown, claws black; irides hazel.

The female is much smaller than the male, measuring more than an inch less in the length of wing. She has no ruff, and nearly all the small feathers are velvety black, varying in different individuals in the colour of their margins, from greyish white to chestnut-buff. The feathers of the breast and flanks are light or dark brown, with bright or dull buff margins, and the rest of the underparts are white. After the autumn moult the feathers of the upper parts are greyish brown, with dark centres and pale margins, and the underparts are white, suffused with brown on the throat. Young in first plumage resemble adult females in summer plumage in the colour of their upper parts; but in that of their underparts they resemble adults in winter plumage, except that in both the white is replaced by buff, very pale in the centre of the belly and the under tail-coverts. Birds of the year resemble adults in winter plumage, but are darker on the breast, and have traces of the previous plumage on the wing-coverts and innermost secondaries. Young in down are rich chestnut-buff, marbled with black and dusted with pale buff on the upper parts, and are pale chestnut-buff on the underparts.

TOTANUS HYPOLEUCUS.

COMMON SANDPIPER.

(Plate 30.)

Tringa guinetta, *Briss. Orn.* v. p. 183, pl. xvi. fig. 2 (1760).
Tringa hypoleucos, *Linn. Syst. Nat.* i. p. 250 (1766); **et auctorum plurimorum**—*Gmelin, Latham, (Naumann), (Schlegel), (Newton), (Sclater), (Saunders)*, &c.
Totanus hypoleucos (*Linn.*), *Temm. Man. d'Orn.* p. 424 (1815).
Totanus guinetta (*Briss.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 30 (1816).
Actitis hypoleucus (*Linn.*), *Boie, Isis*, 1822, p. 560.
Trynga leucoptera, *Pall. Zoogr. Rosso-Asiat.* ii. p. 196 (1826).
Tringoides hypoleucus (*Linn.*), *Bonap. Sagg. Distrib. Metod.* p. 58 (1831).
Guinetta hypoleuca (*Linn.*), *Gray, List Gen. B.* p. 68 (1840).
Actitis empusa, *Gould, Proc. Zool. Soc.* 1847, p. 222.
Actitis schlegeli, *Bonap. Compt. Rend.* xliii. p. 597 (1856).

The Common Sandpiper is a well-known summer visitor to the British Islands. It is most partial to elevated moorland districts, and consequently is only known on migration in the low-lying eastern counties south of the Humber and east of the Severn. A few pairs nest on the wild moorland districts of the south-west of England, and it occurs more frequently in Wales, but its true breeding-range is almost similar to that of the Red Grouse. North of Derbyshire it is very commonly distributed in all suitable localities, including the Orkneys and Shetland and the Outer Hebrides. In Ireland it is an equally well-known bird, and breeds in suitable places throughout the country. To the Channel Islands it only appears to be a visitor on spring and autumn migration.

The Common Sandpiper has a very extensive range, reaching from the Atlantic to the Pacific. It breeds throughout Scandinavia, but in North Russia and Siberia it is not found north of the Arctic circle *. It breeds in suitable localities throughout Europe, and in Asia as far south as Turkestan (and possibly Persia), Cashmere, China, and Japan. A few remain all the year round in the basin of the Mediterranean; but its principal winter-quarters are throughout Africa in suitable localities, India, Ceylon, Burma, the islands of the Malay archipelago, and the coasts of New Guinea and Australia. It has been found during the breeding-season in Teneriffe and North-east Africa, but in neither of these localities have its eggs been obtained. Its alleged occurrence on the island of Kodiak, south of Alaska, does not appear to be admitted by the American ornithologists. On the continent of America it is represented

* In my paper on the ornithology of Siberia (Ibis, 1879, p. 152) the range of this species is incorrectly given. After the words "found it frequent on the banks of the river wherever I went," the words "south of the Arctic circle" were accidentally omitted.

by a perfectly distinct species, *Totanus macularius*, which, as it has occurred in the British Islands, is treated of in this volume.

The Common Sandpiper arrives in England about the middle of April, but it does not reach its breeding-grounds in Scotland before the last week of that month. At Gibraltar it swarms in March and April, and Irby states that the migration is at its height about the 15th of the latter month. About this time it also passes Malta on its way northwards, being common there from March to May. It arrives in France, Belgium, and Denmark in April, but a little later in Sweden, and in the extreme north not until June, when the streams are free from ice and snow. It leaves England in September and October, which appears to be about the date of its general passage southwards. The return migration at Gibraltar lasts through August, September, and October.

The haunts of the Common Sandpiper or "Summer Snipe," as it is frequently called in this country, are the margins of inland lakes and streams, large reservoirs, and mountain-lochs. It loves the sandy banks of the upland streams, and is especially fond of frequenting those portions that are gravelly. It chooses the wildest parts of the country, and is found in the same localities as those frequented by the Dipper. High up amongst the mountains its melodious cry may be heard from the shingly margin of the stream, or the bird may be seen not unfrequently perched on some rock surrounded by the water. Even here the Sandpiper shows a partiality for certain haunts. The Dipper loves the streams in their wildest mood, and the more they roll and toss over the rocky boulders the more he seems at home; but the Sandpiper prefers their slow-running reaches and sandy driftwood-covered islets, where the shingly or oozy rush-grown banks afford it the haunt it needs. It is an unobtrusive little bird, but its habits and actions are full of interest. It may be seen running nimbly along the sands or tripping over the mud-banks, ever in motion, exploring them in search of food. It often wades into the shallows or perches on a large stone near the edge of the water. Although by no means a shy bird, it is sufficiently wary not to allow a very close approach, unless the greatest caution is observed. It is incessantly in motion. Nimbly it runs over the muddy banks, skirting the very edge of the rippling stream, or pausing a moment, with head held suspiciously erect, as if aware of the presence of danger. All the time its little body seems quivering with excitement, full of that nervous movement so observable in the Wagtails, and its short tail is repeatedly jerked up and down. If alarmed, it utters its shrill but musical call-note of *weet* or *wince*, and hurries along over the water to alight on some other part of the bank where it can be more secluded. Its flight is rapid, performed with quick regular beatings of the wings, which are much bent; and often, just before it reaches the end of its flight, it skims along and then alights with erected

wings, folding them in a few moments. Sometimes it flies so close to the water that its wings strike the surface and leave a long succession of rings marking its course.

Few birds are more attached to their haunts than the Common Sandpiper. Regularly every season it appears in them. The same stream will be tenanted, the same favourite stretch of gravel be used for a nesting-site, even though the bird is disturbed and its nest repeatedly robbed. Shortly after their arrival at their breeding-grounds the males are very demonstrative and excessively noisy. In early summer they may often be seen running along the rough stone walls near the water, with drooping wings, as if displaying their charms to the females crouching amongst the herbage below. At this season the cock birds sometimes soar into the air and utter a short trill, as is the case with most other Waders. It is said sometimes to perch on bushes; and Mr. Carter informs me that he once saw one perched on the top branch of an ash tree thirty feet from the ground.

The food of the Common Sandpiper is composed largely of worms and insects, with their larvæ. It may sometimes be seen searching for beetles amongst the droppings near water where cattle drink, and it also catches many insects as they flit past, as well as takes them from the water or the stems of plants. It is very possible that it also eats mountain-fruits, such as bilberries, and small bits of gravel are generally found in its gizzard.

The breeding-season of the Common Sandpiper commences in May, and fresh eggs may be found almost all through that month, the birds in Scotland breeding a little later than those in the south of England. It is possible that this bird pairs for life, for season after season its eggs may be found in one particular spot. The nest is rarely very far from the water's edge, and several pairs of birds often breed on the banks of one small piece of water, or at irregular intervals not far from the stream. A favourite situation is on the sandy banks, which are carpeted with coarse grass, or amongst the herbage on the higher land near the water. Another very favourite situation is a little stretch of sand and gravel at some distance from the water, strewed with large stones and tufts of heather and bilberry. It is usually protected on one side at least by a little bush or tuft of herbage. Mr. Gray has found the nest in turnip-fields, snugly hidden under the broad leaves, and in gardens and orchards beneath the shelter of plants. It sometimes nests at some distance from water; and Mr. Carter has informed me that at Masham it frequently builds in the woods on the banks of the river as much as two hundred yards from the stream. The nest is very simple, a little hollow scratched in the ground, and lined with a few bits of dry grass, scraps of heather, dead leaves, or bits of withered rush. In this slight cradle the female lays four eggs, very large in comparison with the size of the bird. They vary

in ground-colour from white, with the faintest possible tinge of green, to pale creamy buff, speckled, spotted, and blotched with light and dark reddish brown, and with underlying markings of inky grey. The markings are seldom very large, varying in size from that of a small pea to a mere speck, and are most numerous on the large end of the egg. Sometimes the markings are confluent on the large end, gradually becoming scattered over the rest of the surface. They are pyriform in shape, and vary in length from 1·6 to 1·4 inch, and in breadth from 1·13 to 1·0 inch. They most closely resemble those of the Green Sandpiper, being similar in colour, but on an average those of the latter bird are larger; small examples, however, of those of the Green Sandpiper cannot safely be distinguished from large examples of those of the Common Sandpiper, nor can exceptionally handsome eggs of the latter bird be distinguished from the plainer varieties of the eggs of the Wood-Sandpiper.

The Common Sandpiper only rears one brood in the year; but if the first eggs be taken, others are generally laid, not far from the site of the former nest. No bird is more anxious, or strives more to allure the intruder away from the nest, than the Common Sandpiper. The sitting bird will start up from its charge and run along the ground as if wounded, or roll over and over as if perfectly helpless; but if pursued it rises with a triumphant *weet*, after having performed these actions for some distance. When leaving the nest of its own accord, the sitting bird always runs for a few yards ere taking wing; and the eggs so closely resemble the colour of surrounding objects as almost to defy discovery. When the young are hatched the poor little Sandpipers are even more anxious and allow an intruder to get quite close, without any thought of their own safety. Sometimes the bird will then spread out its tail like a fan, letting the outside feathers scrape the ground, and it will often hiss defiance at the intruder. The young birds, from what my friend Mr. Charles Doncaster has observed, appear to remain in the nest for several hours at least after they are hatched. Mr. Carter informs me that he has heard the Common Sandpiper keep up an incessant squealing note, which he compares to that of a rat in a trap, whilst he was looking at a nest of eggs on which the bird had been sitting some time.

The Common Sandpiper does not frequent the sea-coast much during its visit to our islands, but in its winter-quarters it is to be observed very often searching the mud-flats for food. It also frequents rocky coasts at this season and during migration, in this respect resembling the Purple Sandpiper. The Common Sandpiper is said both to swim and to dive; but this is only in exceptional cases, and in times of need, when hard pressed by enemies or when wounded. It rarely, if ever, associates into flocks, and generally not more than two or three are observed in company.

The Common Sandpiper varies very little in colour; the plumage of the

sexes is alike, and the variations attributable to age and season are small. The difficulty of studying them is also increased by the fact that both the spring and autumn moults take place whilst the bird is absent from this country at its winter-quarters. An example in the Anderson collection from India, obtained on the 1st of October, is moulting its quills; one in the Swinhoe collection from China, captured in March, is in the same condition; whilst two examples collected by Dr. Emin Bey on the 16th of February are both moulting their primaries.

The general colour of the upper parts of the adult in breeding-plumage is a sandy brown, which becomes a greenish brown on the wing-coverts, rump, upper tail-coverts, and tail, and a neutral brown on the quills; all the small feathers have dark central streaks, and the wing-coverts, innermost secondaries, scapulars, and upper tail-coverts are barred with dark brown. A white bar across the wing, formed by the white tips of the greater wing-coverts, the white bases of the secondaries, and the white on the basal half of the inside web of most of the primaries, is conspicuous during flight. The three outer tail-feathers on each side are barred with black and white. The underparts are white, suffused with brown on the sides of the breast, and streaked with dark brown on the neck, breast, and under wing-coverts. Bill dark brown, paler at the base; legs and feet greyish olive; claws black; irides hazel. After the autumn moult, the streaks and bars on the upper parts are scarcely perceptible, except on the wing-coverts and upper tail-coverts; and although the sides of the neck and breast are still suffused with brown, the streaks have all but disappeared, and the general colour of the upper parts has become a glossy greenish brown. Young in first plumage have the underparts as in adult winter plumage, but the upper parts differ from those of winter in having each feather edged with a marginal line of buff and a submarginal line of black. Young in first winter and first spring plumages retain the light and dark crescentic markings, especially on the wing-coverts, scapulars, and rump. Young in down are pale grey, marbled with black on the upper parts.

TOTANUS MACULARIUS.

SPOTTED SANDPIPER.

(Plate 30.)

Tringa turdus aquaticus, *Briss. Orn.* v. p. 255 (1760).
Tringa macularia, *Linn. Syst. Nat.* i. p. 249 (1766); **et auctorum plurimorum**—*Wilson*, (*Audubon*), (*Baird, Brewer, & Ridgway*), (*Coues*), &c.
Totanus macularius (*Linn.*), *Temm. Man. d'Orn.* p. 422 (1815).
Actitis macularius (*Linn.*), *Boie, Isis*, 1826, p. 979.
Tringoides macularia (*Linn.*), *Gray, Gen. B.* iii. p. 574 (1846).
Tringites macularius (*Linn.*), *Scl. & Salv. Proc. Zool. Soc.* 1873, p. 309.
Tringoides hypoleucos, *var.* macularius (*Linn.*), *Ridgw. Ann. Lyc. N.Y.* x. 1874, p. 384.

In Harting's 'Handbook of British Birds' no fewer than nineteen alleged occurrences of the Spotted Sandpiper in our islands are recorded. Gurney, in his 'Rambles of a Naturalist,' criticizes these seriatim, and satisfactorily proves that many of them are cases of mistaken identity, whilst others, though correctly identified, are instances—alas, too common—of foreign skins having been sold as British. Gurney reduced the nineteen down to seven possible occurrences; Saunders regards only four as tolerably satisfactory; whilst the 'Ibis List' dismisses the Spotted Sandpiper from the roll of British birds with the curt observation—"Of doubtful occurrence in the United Kingdom!" I venture to think that if any of those ornithologists had been personally acquainted with the Spotted Sandpiper, and with the habits of migratory birds in general, they would have come to a very different conclusion. I have both seen and shot this bird during its autumn migrations on the banks of rivers and on the shores of lakes both in Canada and in the United States, in both which countries it is as abundant as the Common Sandpiper is in England, but I never had the good fortune to meet with a bird having a spotted breast. I have examined many rare migrants both in this country and in Heligoland; and I venture to say that for one adult bird which wanders out of its usual line of migration, ten young birds in first plumage (or, in the case of species which moult that plumage before they migrate, birds of the year) are found to do so. Consequently if we accept the numbers admitted by Mr. Howard Saunders as the lowest estimate deserving of serious consideration, it seems very probable that if four adult Spotted Sandpipers have visited our shores, thirty or forty young in first plumage may have strayed as far as the British Islands. Saunders remarks that "birds of the year are far less spotted on the underparts than the adults"—a statement which is verbally accurate, inasmuch as, so far as I know, they are always absolutely destitute of spots on the underparts, and would naturally escape detection, except in the hands

of experienced ornithologists. As is hereafter explained, they may easily be detected by the relative amount of white on the secondary quills. It is extremely probable that the example recorded by Edwards (Gleanings in Nat. Hist. vi. p. 141) as having occurred in Essex in May 1743 was a Common Sandpiper, as it was obtained in spring; but Bewick's Spotted Sandpiper, "shot in the month of August on the bleak moors above Bellingham, in Northumberland," is not only figured with the spots on the back more regular than is usually the case with the Common Sandpiper, but the secondaries are described as "tipped with white," whilst those of the Common Sandpiper are said to be marked with white on the middle of both webs, as well as tipped with white.

Of the adult Spotted Sandpipers alleged to have been obtained in this country, the evidence in support of the genuineness of the following occurrences remains unshaken. One shot near Whitby on the 29th of March 1849 (Sir W. Milner, 'Zoologist,' 1849, p. 2455); a second and third shot by Edwin Lord, of Warrington, on the Mersey, below that town, in May 1863 (Ecroyd Smith, 'Notabilia of the Mersey District,' p. 51); a fourth and fifth shot by Mr. Tee at Crumble Pond, near Eastbourne, early in October 1866; and a sixth and seventh left in the flesh in August 1867 at the Museum of Aberdeen, and probably shot in the neighbourhood (Gray, 'Birds of W. of Scotland,' p. 299).

The Spotted Sandpiper has a very similar range in America to that of the Common Sandpiper in the Old World. In the north it does not quite reach the Arctic circle; but it breeds throughout the United States of America, migrating southwards in autumn to winter in Mexico, the West Indies, Central America, and the northern portion of the South-American continent. It visits the Bermudas in considerable numbers, some of which remain during the winter, so that its accidental occurrence in our islands might reasonably be expected. It has been said to have occurred on the continent of Europe; but the evidence in support of this statement is not very satisfactory.

The Spotted Sandpiper is so nearly allied to the Common Sandpiper that Ridgway at one time did not admit the specific distinctness of the two birds, and regarded the American form as a variety of the European one; but in his last work he reinstates the Spotted Sandpiper in its former specific rank. The fact that the immature birds of both species very closely resemble the adult of the Old-World species, and differ conspicuously from that of the New-World species, points to the conclusion that the common ancestors of both inhabited the Old World, and that the Spotted Sandpipers are the descendants of a colony of Common Sandpipers which migrated or, rather, emigrated to Alaska from North-east Siberia within comparatively recent ages, and have since become slightly modified in colour to suit their present surroundings.

I made the acquaintance of the Spotted Sandpiper last autumn. West of Lake Ontario the country is drained by numerous rivers, or creeks as they are locally called, on the banks of which, trees of various kinds flourish. In autumn, when the ground is dry, these little creeks dwindle down to very small streams, but spread out here and there into little swamps and marshes, and are the great resort of birds of various kinds. Of the true water-birds the Great-belted Kingfisher is the most conspicuous, the Killdeer Plover the noisiest, and the Spotted Sandpiper the most numerous. The latter bird is very unobtrusive. If his back is turned towards you he is almost invisible on the stony shores. If his white breast can be seen, he sees you almost as soon as you see him; and though the white bar across his expanded wings is conspicuous enough during flight, the rapidity of his motions saves him from the inexperienced shooter. The habits of the Spotted Sandpiper are precisely the same as those of its European representative. It gets up with the same cry, repeated oftener, louder, and quicker the more alarmed it happens to be. It runs along the sandy or muddy banks with great rapidity, dodges between the stones, on one of which it perches for a few moments, and begins to nod its head and jerk its tail, as if trying to gulp down a refractory worm. Both on the shores of Lake Erie and on the banks of the creek near the residence of my friend Mr. W. E. Brooks, in Ontario, this bird was common, but neither Allan nor I saw an adult bird during my stay there in the last half of August. They were for the most part solitary, and in neither locality did we see more than two or three together.

It is not known that the Spotted Sandpiper differs from its European ally in its choice of a nesting-site; but Audubon remarked that in the colder climate of Labrador it concealed its nest under ledges of rocks, collected a considerable amount of moss for the outer walls, and added a compact lining of slender grasses and feathers of the Eider Duck. The eggs are four in number, pale buff in ground-colour, with very dark reddish-brown spots and blotches, which vary in size from that of a pea down to a speck. The underlying spots are pale grey in colour, occasionally very large and conspicuous, but generally small and obscure. The eggs vary in length from 1·35 to 1·2 inch, and in breadth from 1·0 to 0·9 inch. Compared with eggs of the Common Sandpiper they are smaller, more boldly spotted, and the spots are much darker. Except in being much smaller, they closely resemble eggs of the Killdeer Plover, but on an average they are less richly marked, and the spots are not so often confluent.

The Spotted Sandpiper differs from its Old-World representative in several important points. Adults in summer have a large, nearly round, black spot at the tip of every feather of the underparts, except on the centre of the belly, and the dark bars on the upper parts are somewhat more regularly distributed over the entire surface. At all seasons of the year

the preponderating colour on the secondaries is brown instead of white, the amount of the latter colour both at the tip of the feather and at the base being very much less than in its Old-World ally; the amount of white on the outer tail-feather is also less. The basal portion of the bill is much paler, but otherwise the soft parts do not differ in colour. After the autumn moult it is extremely probable that the underparts are unspotted, as in immature birds; but this is a question upon which American ornithologists give us no information whatever*, with the exception of Audubon. Young in first plumage differ from those of the Common Sandpiper in having no dark streaks on the throat. Young in down scarcely differ from those of the Old-World species.

* The Spotted Sandpiper, like its Old-World representative, migrates from its breeding-quarters in its abraded summer dress. There is no doubt that immature birds do not get spotted breasts until spring; but I have been unable to find winter skins with spotted underparts, or examples with unspotted underparts which did not show signs of immaturity on the wing-coverts. The difficulty in this case is that both moults take place in the winter-quarters of the bird in South America, from which country our information is meagre in the extreme. Audubon says distinctly that the lower parts of the young in winter are without spots, and he also says that the young differ from the old until the approach of winter, when, with the exception of their being slightly smaller, no difference can be perceived. The inference of course is that the adult in winter is unspotted; but it is not easy to understand where Audubon could have seen this bird in winter, unless a few remain in Texas until their autumn moult is completed.

COMMON SANDPIPER'S NEST.

TOTANUS OCHROPUS.

GREEN SANDPIPER.

(Plate 30.)

Tringa tringa, *Briss. Orn.* v. p. 177, pl. xvi. fig. 1 (1760).
Tringa ochropus, *Linn. Syst. Nat.* i. p. 250 (1766); **et auctorum plurimorum—**
(*Naumann*), (*Bonaparte*), (*Schlegel*), (*Dresser*), (*Saunders*), &c.
Totanus ochropus (*Linn.*), *Temm. Man. d'Orn.* p. 420 (1815).
Helodromas ochropus (*Linn.*), *Kaup, Natürl. Syst.* p. 144 (1829).
Actitis ochropus (*Linn.*), *Jerdon, B. India*, iii. p. 698 (1864).

The Green Sandpiper is principally known in the British Islands as a frequent visitor on spring and autumn migration. There seems to be strong circumstantial evidence that it has bred in the East Riding of Yorkshire (Stevenson, 'Birds of Norfolk,' ii. p. 226); but there is no authentic account of its eggs ever having been taken in this country. A few birds are occasionally seen during summer, but these may be immature. It is also sometimes obtained in England in winter. On migration it appears to be generally distributed, though it is rare in the west and north of Scotland, still rarer in the west of Ireland, and has not occurred on the Hebrides or on the Orkney or Shetland Islands.

The breeding-range of the Green Sandpiper reaches from the Atlantic to the Pacific, in the west extending somewhat north of the Arctic circle, but in the east scarcely reaching that latitude. It is not known that this bird breeds in the north of France, Holland, Belgium, or Western Germany; but it has been recorded as doing so in the Pyrenees, the Alps, the Carpathians, and the Caucasus. Further east the southern limit of its breeding-range appears to be Turkestan and the mountains of Southern Siberia. It has been said to breed in Japan and North China; but the evidence of this is very unsatisfactory, although it certainly winters in both those countries, as well as in Cochin China, Burma, India, Ceylon, and westwards, in suitable localities, throughout Persia, South Europe, and the whole of Africa *.

* There is not a shred of evidence in support of the statement that this species has occurred on the American continent. Baird, Brewer, and Ridgway base its claim to be an American species on a skin, said to have been sent from Halifax, Nova Scotia, purchased by Mr. Harting from Mr. Whitely, "a perfectly trustworthy dealer of Woolwich." I know Mr. Whitely very well. As Mr. Harting says, a more trustworthy dealer is not to be found; but great numbers of skins pass through his hands, and occasionally a label (which generally contains the locality without the name of the species, otherwise the

On the American continent it is represented by a near ally, *T. solitarius*, which, as it is said to have occurred more than once in our islands, will be treated of in this volume.

The Green Sandpiper is an early migrant, arriving at its breeding-grounds in Pomerania before the middle of April, and having eggs during the latter part of that month, or during the first half of May. Further north it is, of course, much later; I did not see it on the Arctic circle, in the valley of the Yenesay, until the 15th of June, and found a nest containing one egg, about thirty miles further north, on the 6th of July. In many of its habits it resembles the Common Sandpiper, and still more its American representative, the Solitary Sandpiper. It is not a shore-bird; during the breeding-season it chooses for its residence a swamp surrounded by forest, and on migration it frequents the shores of rivers rather than the sea-coast. In South Siberia I found it common in August, both on the banks of the Obb and the Yenesay, slowly migrating up the stream. The Green Sandpiper is one of the least gregarious of its family. It is rarely seen in flocks; singly or in pairs it performs its long journeys; and at its winter-quarters in India and elsewhere it is described as a very solitary bird, rarely associating with others of its kind or with allied species.

Like most short-legged Sandpipers, this bird is much less wary than its long-legged relations; it is a very easy bird to stalk, but seldom allows of a near approach where there is no cover. On the wing it can fly fast enough, but on the ground it walks like a *Totanus*, rather than runs like a *Tringa*. Its note is very soft and musical, not nearly so loud as that of the Redshank, and may be represented by the syllables *tyĕ-tyĕ-tyĕ*, which, when the bird is alarmed, becomes a loud excited *tyük-tyük-tyük*. These notes are no doubt modulated into a musical trill as the male performs his amatory excursions in the air during the pairing-season, but I have not had the good fortune to hear the love-song of the Green Sandpiper or to find it described.

So far as is known, this species is entirely insectivorous, but probably no form of insect life is rejected by it.

The most remarkable fact connected with the history of the Green Sandpiper is the singular site which it chooses for the incubation of its eggs. So far as is known, it is the only Sandpiper which does not lay its eggs on the ground, in a hollow, more or less slightly lined with dead grass or lichen. The Green Sandpiper lays its eggs in a tree, but it is

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mistake would be at once detected) is accidentally attached to the wrong bird. I have frequently purchased skins of rare birds from Mr. Whitely with impossible localities written on the labels; indeed it would be almost a miracle if mistakes never occurred in the labelling of the piles of skins which are continually coming into his possession.

not known that it ever builds a nest. Sometimes its eggs are placed in the fork of a tree-trunk—on the leaves, or lichens and moss, which may have accumulated there; more often the old nest of a Song-Thrush or Missel-Thrush is chosen; and in Siberia I have taken the eggs from the old nest of a Fieldfare in a willow tree, six feet from the ground. Old dreys of the squirrel, the forsaken nests of the Ring-Dove, Jay, Red-backed Shrike, and even old Crows' nests have all been known to be used as nesting-places by the Green Sandpiper.

It is only comparatively recently that this extraordinary habit of the Green Sandpiper has become known. Naumann admits that he never had the good fortune to find a nest of this species, and does not seem to have suspected that it laid its eggs in trees; but as long ago as 1847 my good friend Homeyer, of Stolp, sent Thienemann eggs of the Green Sandpiper which he had himself taken out of an old Blackbird's nest in a juniper bush in Pomerania. The foresters in this district had long been acquainted with the curious breeding-habits of this bird, and Forstmeister Hintz (Journ. Orn. 1862, p. 460) published the particulars of numerous nests that he had taken from 1818 to 1862. I have myself seen the Green Sandpiper in the same district, where Forstinspector Wiese climbed thirty feet up a pine tree to take his first nest of this bird in 1846 (Journ. Orn. 1855, p. 514). On the 30th of May, 1882, as I was walking in a forest, about twenty miles south of Stolp, with my friend Dr. Holland, we passed a small swamp where a Green Sandpiper attracted our attention by its loud cries. A few stunted larches and alder bushes still grew in the swamp, and the bird flew from branch to branch and bush to bush in the most excited manner, having, no doubt, young for whose safety it was so anxious. Hintz says that he has known the nest in a hole in a fallen tree-trunk, on the stump of a felled or broken-down tree, but most commonly in old nests from three to twelve feet from the ground, though on one occasion he took the eggs from an old squirrel's nest in a birch tree as high as thirty feet. Four is the full clutch of eggs, which vary in ground-colour from creamy white to white with the faintest tinge of olive on the one hand, and to very pale reddish brown on the other. The surface-spots are dark reddish brown, generally most numerous on the large end of the egg, and seldom larger than no. 4 shot; the underlying markings are similar in size and distribution, but are pale greyish brown in colour. They vary in length from 1·6 to 1·5 inch, and in breadth from 1·15 to 1·05 inch. In general appearance they most nearly resemble eggs of Bartram's Sandpiper and the Common Sandpiper, between which they are intermediate in size.

The adult male Green Sandpiper in full breeding-plumage has the general colour of the upper parts dull olive-brown, streaked on the head and neck with white, and spotted with white on the mantle, scapulars, and

innermost secondaries, each spot being emphasized with a dark brown base; the wings, wing-coverts, and lower back are almost unspotted brown; the rump, upper tail-coverts, and outside tail-feather on each side are pure white, the remaining tail-feathers pure white, more or less broadly barred with black. The underparts are pure white, streaked with brown on the neck, upper breast, and flanks. The axillaries and under wing-coverts are brown, narrowly barred with white. Bill nearly black; legs and feet slate-grey, suffused with green at the joints; claws dark brown; irides dark hazel. The female does not differ in colour from the male. After the autumn moult, the only change which has taken place in the colour of the plumage is, that the white streaks on the head and neck have disappeared, and the white spots on the rest of the upper parts have become smaller and more obscure, though they extend to the lower back and greater and median wing-coverts. Young in first plumage resemble adults in winter plumage, except that the general colour is somewhat darker, the white spots are replaced by chestnut-buff spots, the white feathers of the rump, upper tail-coverts, and outside tail-feathers have dark tips, and the sides of the breast are suffused with brown. Birds of the year are much less spotted on the upper parts than adults in winter plumage, and retain some of the dark tips of the feathers of the rump. Young in down closely resemble those of the Wood-Sandpiper, but are whiter underneath and the ground-colour of the head is greyer.

TOTANUS SOLITARIUS.

SOLITARY SANDPIPER.

Tringa solitaria, *Wilson, Am. Orn.* vii. p. 53, pl. 58. fig. 3 (1813); **et auctorum plurimorum**—(*Audubon*), (*Baird, Brewer, & Ridgway*), (*Coues*), &c.
Totanus chloropygius, *Vieill. N. Dict. d'Hist. Nat.* vi. p. 401 (1816).
Totanus caligatus, *Licht. Verz. Doubl.* p. 74 (1823).
Tringa macroptera, *Spix, Av. Bras.* ii. p. 76 (1825).
Rhyacophilus chloropygius (*Vieill.*), *Bonap. Compt. Rend.* xliii. p. 597 (1856).
Rhyacophilus solitarius (*Wilson*), *Baird, Cassin, & Lawrence, B. N. Amer.* p. 733 (1860).

Pennant was acquainted with the Solitary Sandpiper, but did not discriminate between it and the Green Sandpiper. Latham attempted to diagnose the two forms, and timidly raised the American species to the rank of a variety of the European bird. Wilson saw at once that the differences were specific, and described the Solitary Sandpiper as a new species. There can be no question that the Solitary Sandpiper is specifically distinct from the Green Sandpiper, of which it is the representative on the American continent.

An example of the Solitary Sandpiper is said to have occurred in Scotland (Gray, 'Ibis,' 1870, p. 292). The author of the 'Birds of the West of Scotland' writes that a Green-rumped Tatler, or Solitary Sandpiper, "was shot some years ago by the late William Gordon, of Airdrie, somewhere on the banks of the Clyde, in the higher grounds of Lanarkshire." This statement is somewhat vague and unsatisfactory; but a second example having been obtained at Scilly, the Solitary Sandpiper may fairly claim to be admitted into the British list as a rare accidental visitor. This example is in the collection of Mr. Dorrien Smith, of Tresco, Scilly (Cornish, 'Zoologist,' 1882, p. 432), and was shot on the 21st of September, 1882. In the record of its capture it is stated that the upper tail-coverts were not white; and in a subsequent communication to Mr. Saunders, Mr. Cornish mentions that the example was identified from Wilson's plate, which is a very good one.

The Solitary Sandpiper is found during the breeding-season on the American continent as far south as lat. 44°, and northwards up to the limit of forest-growth, which in the west extends beyond the Arctic circle, but in the east not nearly so far north. On migration it passes through most of the United States, though many cross the ocean by way of the Bermudas, whence it may easily be carried to our coasts by storms or contrary winds. In Mexico, Central America, Trinidad, and the West Indies it probably only occurs on migration; but it winters in South America in Brazil and Peru.

I shot a single example of this species last autumn at the mouth of the Potomac. It was standing on the banks of a little pool, apparently taking no notice whatever of the large and small flocks of other Sandpipers feeding on the mud-flats at no great distance. American naturalists describe its habits as very similar to those of its Old-World representative. Like that bird, it prefers inland pools and rivulets to the sea-shore, and is comparatively unsocial in its disposition, being very rarely found in flocks and seldom associating with other Sandpipers. Whether the similarity in the habits of the two species extends to the mode of nidification is not known. Possibly the cause of its nest remaining hitherto undiscovered is to be found in the fact that it also builds in trees.

The Solitary Sandpiper may at once be distinguished from its Old-World relative by the colour of its rump and upper tail-coverts, which are not white, as in that species, but brown sparingly spotted with white, like the back. It is intermediate in size between the Green and Wood-Sandpipers; but in having the shaft of the first primary brown instead of white, and in the colour of the wing-coverts, scapulars, axillaries, under wing-coverts, &c., it resembles the former, but differs from the latter. Besides the difference in the colour of the rump already pointed out, the adult Solitary Sandpiper in spring plumage has the base of the inner web of the first primary mottled with white, showing an apparent affinity with the Buff-breasted and some other Sandpipers. The seasonal changes of plumage are precisely the same in the Solitary Sandpiper as in the Green Sandpiper, except that in the young in first plumage of the former the spots are buffish white instead of chestnut-buff. It is not known that there is any difference in the colour of the soft parts. Young in down are absolutely unknown.

TOTANUS GLAREOLA.

WOOD-SANDPIPER.

(Plate 30.)

Tringa glareola, *Linn. Syst. Nat.* i. p. 149 (1758); *Gmel. Syst. Nat.* i. p. 677 (1788); **et auctorum plurimorum** — (*Naumann*), (*Schlegel*), (*Blyth*), (*Dresser*), (*Saunders*), &c.
Tringa ochropus, β. glareola, *Linn. Syst. Nat.* i. p. 250 (1766).
Tringa grallatoris, *Mont. Orn. Dict. Suppl.* App. S (1813).
Totanus glareola (*Linn.*), *Temm. Man. d'Orn.* p. 421 (1815).
Totanus affinis, *Horsf. Trans. Linn. Soc.* xiii. p. 191 (1822).
Totanus grallatoris (*Mont.*), *Steph. Shaw's Gen. Zool.* xii. pt. i. p. 148 (1824).
Rhyacophilus glareola (*Linn.*), *Kaup, Natürl. Syst.* p. 140 (1829).
Actitis glareola (*Linn.*), *Jerdon, B. India*, iii. p. 697 (1864).
Totanus glareoloides, *Hodgs. fide Jerdon, B. India*, iii. p. 697 (1864).

The Wood-Sandpiper is a somewhat irregular straggler on spring and autumn migration to the British Islands, being most frequently met with on the south and east coasts of England, but sometimes at considerable distances from the sea. It has only once been known to breed in England, in the now drained Prestwick Car, where Mr. Hancock obtained its eggs on the 3rd of June, 1853; and it is not improbable that similar instances may have occurred elsewhere, but have escaped notice. In Scotland it is of much rarer occurrence, only one example having been obtained in the west; but it has been found several times in the eastern counties, and its eggs are said to have been taken near Elgin. The Wood-Sandpiper has not yet been known to visit Ireland.

The Wood-Sandpiper has a very extensive breeding-range. It has occurred in the Faroes, and is a summer visitor to the whole of Europe north of the valley of the Danube, to Siberia, Turkestan, Mongolia, and the extreme north of China. It probably breeds as far north as land extends, as Middendorff found its nest in lat. 70° on the Taimur peninsula. It winters in the basin of the Mediterranean and in suitable localities throughout Africa. In Asia it winters in Persia, Beloochistan, India, Ceylon, the Burma peninsula, and the islands of the Malay archipelago, but only passes through Japan and South China on migration.

The Wood-Sandpiper is represented on the American continent by a very close, though rather longer-legged ally, the Yellow-legged Sandpiper (*Totanus flavipes*), to which, as it has been said to have occurred in our islands, the next article will be devoted.

The Wood-Sandpiper was long confounded with the Green Sandpiper, a perfectly distinct species, which, besides many other points of difference,

has quite differently coloured axillaries. In the Green Sandpiper these feathers are dark brown, narrowly barred with white; whilst in the Wood-Sandpiper they are white with a few obscure brown bars, and on the wing the Wood-Sandpiper may be distinguished by the white bar across the wings, which is not observable in the Green Sandpiper. Linnæus is supposed to have separated them in the tenth edition of his great work; but in the twelfth edition he degraded the Wood-Sandpiper to the rank of a variety of the Green Sandpiper. Brisson appears to have been unacquainted with the Wood-Sandpiper; but Gmelin seems to have known something of it, as he recognized the specific distinctness. Colonel Montagu, to whom we are indebted for many additions to the list of British birds, rediscovered the species in Devonshire; and though at first he supposed it to be an undescribed bird, he afterwards recognized its identity with the *Tringa glareola* of Linnæus. The confusion has been increased by the unfortunate choice of the name Wood-Sandpiper for this species. The Green Sandpiper is the true *wood*-sandpiper, not only frequenting forests, but actually breeding in trees. The Wood-Sandpiper has, however, borne its name so long that to alter it would make confusion worse confounded; nor is the name entirely inappropriate, inasmuch as it does frequently perch on bushes. The favourite haunts of the Wood-Sandpiper are wide open moors, where little ponds of open water are to be found, half concealed by willow bushes.

Like all the Sandpipers with which we have to deal in this work, the Wood-Sandpiper is a migratory bird, arriving somewhat late in spring and leaving early in autumn. Irby says that they pass Gibraltar from the 9th of March to the beginning of May, and Lord Lilford describes them as passing Corfu about the same date. Naumann states that the spring migration in North Germany lasts from the beginning of April to the beginning of June. They seldom arrive on our coasts before May; and in lat. 66°, in the valley of the Petchora, Harvie-Brown and I first met with them on the 26th of May; whilst on the Arctic circle, in the valley of the Yenesay, I shot my first Wood-Sandpiper on the 6th of June—in both the latter cases among the rather late arrivals. The autumn migration begins early in August.

I first made the acquaintance of this most interesting bird on the fjelds of Lapland, near the Varanger Fjord, in 1874; but in the following year I had much greater opportunities of watching its habits in the valley of the Petchora. On their first arrival they were absurdly tame, allowing us to approach within a few yards of them, as they frequented the pools formed by the rapidly melting snow in the streets of the town of Ust Zylma. A week later we found them very common at Haberiki, thirty miles further north. They were feeding on the edges of the marshes and the little forest tarns; and after we had shot one of them from the summit

of a dead larch tree, between sixty and seventy feet from the ground, we became more reconciled to the name of Wood-Sandpiper. They were excessively tame and were in full song. The note which the male utters during the pairing-season is much more of a song than that of the Grasshopper Warbler, which it somewhat resembles; it is a monotonous *til-il-il*, begun somewhat low and slow, as the bird is descending in the air with fluttering upraised wings, becoming louder and more rapid, and reaching its climax as the bird alights on the ground or on a rail, or sometimes on the bare branch of a willow, the points of its trembling wings almost meeting over its head when its feet find support. This song is a by no means unmusical trill, and has an almost metallic ring about it. The alarm-note of the Wood-Sandpiper is somewhat like the *tyü, tyü* of the Redshank, but much softer. With the exception of Temminck's Stint, the Wood-Sandpiper was the commonest wader in the valley of the Yenesay; and in the valley of the Obb I found it equally common, feeding on the banks of the river in company with Common and Green Sandpipers.

The nest of the Wood-Sandpiper is very difficult to find, and is generally discovered by accident in consequence of the female, who is a somewhat close sitter, flying off, and thus revealing the place where her eggs are concealed. This is generally in open country, not absolutely on swampy ground, but seldom very far from it: a patch of dry ground, overgrown with heath, sedges, and coarse grasses, is generally selected, frequently not far from a few stunted willow bushes, on which the bird not unfrequently alights. The nest itself is a mere hollow in the ground, lined with a few dry stalks and blades of grass. Captain Elwes and I found the Wood-Sandpiper not uncommon on the moors and swamps near Tarm, on the west coast of Jutland, in 1880. We took a nest of this bird containing four eggs on the 17th of May, on a moor within a mile of the village. When I was at Valconsvaard in 1876 I obtained two nests of this bird—one on the 14th and the other on the 23rd of May. In the valley of the Petchora we were not successful in finding the nest; but on the 30th of June we shot a pair of birds, which were very demonstrative, near a small thicket of willows on the tundra, and succeeded in finding three pretty little young in down not more than a day or two old.

The eggs of the Wood-Sandpiper vary in ground-colour from creamy white to dull buff and very pale olive, and are very handsomely spotted and blotched with rich reddish brown. The spots vary in size from a pea downwards, and in the widest part of the egg are often confluent. Occasionally the spots are evenly distributed over the egg, but at the smaller end they are generally less and more scattered, and in rare instances very few and far between. The underlying spots are pale brown, and seldom very conspicuous. They vary in length from 1·55 to 1·4 inch, and in breadth from 1·1 to 1·0 inch. The only eggs at all likely to be confused with those

of this species are exceptionally small and handsome eggs of the Green Sandpiper, which might be difficult to distinguish from exceptionally large and plain eggs of the Wood-Sandpiper.

In its winter-quarters in India and South Africa it is described as seldom seen upon the sea-shore, but as common in marshy districts, principally frequenting the neighbourhood of inland streams and shallow pools. It is seldom seen in large flocks, and is generally found either solitary, in pairs, or small parties. Legge describes it as abundant during the cold season in Ceylon, where it is very fond of frequenting rice-fields, where it picks up insects, and runs about over the newly harrowed soil, totally regardless of the shouts of the natives to their buffaloes. The food of the Wood-Sandpiper is composed of small worms, insects, larvæ, and small mollusks.

The adult male Wood-Sandpiper in full breeding-plumage, after the spring moult*, has the general colour of the upper parts greyish brown, streaked, spotted, and barred with black and white; the upper tail-coverts are white, the longest streaked and barred with dark brown; the lesser wing-coverts, the quills, and the feathers of the lower back are plain greyish brown, with obscure narrow white margins; the tail is white, irregularly barred with black, and on the two centre feathers clouded with brown. The underparts are pure white, streaked with brown on the sides of the neck, breast, and under tail-coverts, and obscurely barred with the same colour on the flanks, axillaries, and under wing-coverts. Bill nearly black; legs and feet pale dull olive, claws darker; irides light brown. The female is not known to differ from the male in colour. After the autumn moult the head, hind neck, and mantle are almost plain brown, the white spots on the rest of the plumage have become almost obsolete, and the black spots are almost confined to the scapulars and innermost secondaries. The upper tail-coverts and tail scarcely differ from those in summer plumage; the spots on the underparts, except on the under wing-coverts, almost entirely disappear, but the breast is suffused with brown. Young in first plumage somewhat resemble the adult in winter plumage, except that the head, hind neck, and mantle, as well as nearly all the other feathers of the upper parts, have buff and white marginal spots, and the streaks on the throat and breast are only obscurely visible. Birds of the year are intermediate between young in first plumage and adults in winter. Young in down are chestnut-buff, mottled with nearly black on the upper parts, and are buffish white, shading into white on the throat, on the underparts.

* An adult male Wood-Sandpiper obtained by Dr. Emin Bey at Lado, in Central Africa, on the 15th of Febuary, has the first primary in each wing only half-grown.

TOTANUS FLAVIPES.

YELLOW-LEGGED SANDPIPER.

(Plate 32.)

Scolopax flavipes, *Gmel. Syst. Nat.* i. p. 659 (1788); **et auctorum plurimorum—** *Wilson*, (*Swainson & Richardson*), (*Audubon*), (*Coues*), (*Baird, Brewer, & Ridgway*), &c.

Totanus natator,
Totanus fuscocapillus,
Totanus flavipes (*Gmel.*),
} *Vieill. N. Dict. d'Hist. Nat.* vi. pp. 400, 409, 410 (1816).

Gambetta flavipes (*Gmel.*), *Bonap. Compt. Rend.* p. 597 (1856).

Totanus leucopyga, *Illiger, fide Giebel, Thes. Orn.* iii. p. 645 (1877).

The Yellow-legged Sandpiper, Yellowshank, or Yellow-legs, as it is variously called, is an American bird which is said to have occurred three times in the British Islands. It was figured and described by Yarrell (Hist. British Birds, 3rd ed. iii. p. 637) from an example in the collection of Sir William Milner, to whom it had been sold by Reid, the birdstuffer in Doncaster, who supposed it to be a Wood-Sandpiper, and stated that it was killed at Misson, about two and a half miles north-east of Bawtry, on the borders of Lincolnshire, by one of a small party of men residing at Misson, who got their living by shooting wildfowl during the season, which they sent to Doncaster (Milner, 'Zoologist,' 1858, p. 5958).

The second record of the occurrence of this species in the British Islands is still less satisfactory, resting solely on the authority of a York birdstuffer (Graham, 'Naturalist,' 1858, p. 291), who merely stated that a fine female of the Yellowshank, shot near Tadcaster by a Mr. N. B. Thompson, was then (17th of Oct. 1858) in his shop in the flesh waiting to be skinned.

The third record, however (Rodd, 'Zoologist,' 1871, p. 2807), can scarcely be disputed. This example, an adult male, of which a full description is given, was shot on the 12th of Sept. 1871, "by Mr. Edward Vingoe, from the margin of a pool in a salt-marsh near Marazion, about two miles from Penzance, a few yards from the sea."

The Yellow-legged Sandpiper is the American representative of the Wood-Sandpiper*. It was originally described by Pennant, in his 'Arctic Zoology,'

* It is a very thankless office to point out the numerous blunders of previous writers; but unless they are corrected, the student must waste much valuable time in trying to reconcile the discrepancies which he is sure to discover, if he be at all interested in his subject. Baird, Brewer, and Ridgway are wrong in saying that "the European analogue of *T. flavipes* is the *T. stagnatilis*." The latter bird is nearest allied to the Redshank. I cannot believe that a slight difference in the length of the tarsus can override similarity of colour, similarity of pattern of colour, and similarity of seasonal changes of colour, and

from an example obtained in autumn in the province of New York, and then in "the rich Museum of American Birds preserved by Mrs. Anna Blackburn of Oxford, near Warrington," and which were "sent over to that lady by her brother the late Mr. Ashton Blackburn." This species breeds in the Arctic regions of the American continent, from Alaska to Greenland. It passes through the Northern States on migration, some choosing the "fly-line" that crosses the Bermudas on their way to the West Indies, whilst others migrate through the Southern States, Mexico, California, and Central America. On the South-American continent it probably winters south of the line, as Durnford found it common in Patagonia. It is said occasionally to breed as far south as Lake Michigan.

The Yellow-legged Sandpiper has two near allies—one much smaller and one much larger than itself, but neither of them differing from it in general appearance. Its Old-World representative, the Wood-Sandpiper (*Totanus glareola*), is a smaller bird with brown legs; but on the American continent a second species, having nearly the same range, is found, the Greater Yellowshank (*T. melanoleucus*), a larger bird, with a bill slightly recurved like that of the Greenshank.

In its habits the Yellowshank does not differ much from its allies. I met with it last autumn at the mouth of the Potomac, in a large flock of smaller Sandpipers which frequented a creek in the forest to feed on the mud when the tide went out. This flock contained many hundred birds, of several species, which fed indiscriminately together, but when alarmed separated into species, or at least into genera. The first birds to take alarm were the Yellow-legged Sandpipers. There were about a dozen of them, long-legged fellows, *Totani* towering above the short-legged *Tringæ*, even above the Killdeer Plovers. The largest birds, they were the shyest and the first to fly off; but wherever they flew to, the rest followed as soon as they were sufficiently alarmed. I also met with a solitary Yellowshank on the banks of a little stream near my friend Mr. Brooks's farm in Canada, between Toronto and Niagara.

MacFarlane and others describe the nest as a mere depression in the

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that to an extent to cause the birds to be generically separated. There can be no question of mimicry in a case of this kind. Saunders is equally wrong (Yarr. Brit. B. 4th ed. iii. p. 468) in supposing that the Solitary Sandpiper is the Nearctic representative of the Wood-Sandpiper. It is the Nearctic representative of the Green Sandpiper. The Nearctic representative of the Wood-Sandpiper is the Yellow-legged Sandpiper. Rodd's description of the latter bird (*loc. cit.*) undoubtedly refers to that species, but the dimensions of the bill must be wrong, $1\frac{1}{16}$ ought no doubt to read $1\frac{7}{16}$. Yarrell also (*loc. cit.*) must be in error in saying that the axillaries were pure white: even in winter plumage, which he is evidently describing, these feathers are always slightly marked with brown. The 'Ibis' List Committee, if not wrong, are strangely capricious in excluding this bird from the British List, after including the Killdeer Plover.

ground. One nest found by Mr. Kennicott near Fort Resolution was a very simple structure, merely a depression in the ground without any lining, under the shelter of a small bush in open country close to the edge of a marsh. Another nest, placed on the ground amongst some small bushes, was a slight hollow lined with a few leaves and twigs. The nests found by MacFarlane were lined with dead leaves, and in some instances were placed near to small lakes. Some of the nests were found as early as the 2nd of June, and in some cases the eggs were hatched by the 19th of that month. MacFarlane noticed in several instances the cock bird perch on the trees near the nest. When the young had hatched out, their parents became very anxious and very noisy, flying from tree to tree before the intruder for a long distance from their nest. The young chicks, seeming to take warning from their screaming parents in the air above them, ran and hid themselves amongst the grass. The eggs are four in number and very handsome. The specimen I have figured was lent to me by Mr. Crowley, and is one of the series which MacFarlane obtained on the Anderson river. The fine series of eggs of this species in the Smithsonian Institution vary in ground-colour from creamy white to pale greyish brown. The surface-spots are dark rich reddish brown, and vary in size from a large pea downwards, many of them becoming confluent and forming large irregular blotches, or occasionally taking the form of streaks. Most of the markings are generally on the larger end of the egg, but on some specimens they are more evenly distributed over the entire surface. The underlying markings are pale grey or greyish brown, and are large and conspicuous. The eggs vary in length from 1·7 to 1·6 inch, and in breadth from 1·2 to 1·08 inch. In colour they resemble those of the Greenshank, but in size they are on an average slightly less than those of the Redshank.

The Yellow-legged Sandpiper feeds on worms, insects, and small mollusks, and is said occasionally to wade into the water to capture small fish. Its note is described as very shrill and several times repeated. Great numbers of these birds are shot when on their autumnal migration, being easily lured by the whistle of the sportsman. Its migration southwards from its breeding-grounds commences in July and continues through August and September. It is said to arrive regularly about the 1st of August on the Bermudas, where it remains till the end of September. It arrives at its breeding-grounds early in May.

The Yellow-legged Sandpiper is a larger bird than the Wood-Sandpiper, and has proportionally longer legs. The latter are about one third longer than those of the European species, whilst the other measurements are about a fifth greater. The differences in colour between the two species are very trifling. The American bird has the white on the rump relatively less, and obscured with traces of bars at all ages. In the winter plumage

the streaks on the neck and breast are almost as distinct as in summer plumage, but those on the under tail-coverts have almost disappeared. The young in first plumage of the two species, as might be expected, resemble each other still more closely; but besides the difference in dimensions, the bars on the rump are more numerous, and the streaks on the under tail-coverts are less distinct in the American than in the European species. In the colours of the soft parts the two species are alike, except that in the adult Yellowshank the legs and feet are bright yellow.

TOTANUS CALIDRIS.

COMMON REDSHANK.

(Plate 32.)

Scolopax totanus, *Linn. Syst. Nat.* i. p. 145 (1758).
Tringa totanus,
Tringa totanus striatus,
Tringa totanus nævius,
Briss. Orn. v. pp. 188, 196, 200 (1760).
Scolopax calidris, *Linn. Syst. Nat.* i. p. 245 (1766); **et auctorum plurimorum**—(*Gmelin*), (*Latham*), (*Schlegel*), (*Gray*), (*Cabanis*), (*Dresser*), (*Saunders*), &c.
Tringa gambetta,
Tringa striata,
Linn. Syst. Nat. i. p. 248 (1766).
Totanus calidris (*Linn.*), *Bechst. Orn. Taschenb.* ii. p. 284 (1803).
Gambetta calidris (*Linn.*), *Kaup, Natürl. Syst.* p. 54 (1829).

The Redshank is one of the commonest and best known of all the Waders found in the British Islands. It is a resident, frequenting almost all parts of the coasts in autumn and winter, and retiring more or less inland in summer, at which season it is generally distributed, though somewhat local. It breeds in all suitable districts in England, especially in the low-lying eastern counties; and in Scotland it is even more numerous, extending to the Hebrides, the Orkneys, and the Shetlands. In the latter islands it is, however, only sparingly met with in the breeding-season. It is a common bird in Ireland, frequenting the coast in winter, but retiring inland to breed.

The geographical distribution of the Redshank is a somewhat peculiar one. It breeds in all suitable localities throughout the whole of Europe (except that east of the White Sea its range gradually drops down to lat. 58° on the Urals) and in North Africa. In the basin of the Mediterranean it appears to be a resident, but to the whole of South Africa it is only a winter visitor. In Siberia its breeding-range only extends as far north as lat. 55°, and appears to be confined to the mountains of Southern Siberia and Turkestan. It breeds on the Caucasus, and probably on some of the Persian highlands. It passes through Mongolia on migration, and winters in India, Ceylon, Burma, China, and the islands of the Malay archipelago, but has not been recorded from Japan. The Redshank does not appear to be represented on the American continent. Its nearest ally is the Marsh-Sandpiper, *T. stagnatilis* *, a slightly smaller bird, with brown instead of red legs, which breeds in the southern portion of the Palæarctic Region,

* This species has been recorded as British (Newman, 'Zoologist,' 1874, p. 4054). Mr. Roberts states that a Mr. Edson, of Malton, informed him that a Marsh-Sandpiper was shot about the 8th of January, presumably in the neighbourhood. No reliance can be placed on such vague statements.

from the basin of the Mediterranean to the valley of the Amoor, and winters in South Africa, India, and South China. The inner webs of the primaries of this species in summer plumage show traces of the marbling found in the Buff-breasted, Bartram's, and some other Sandpipers.

In consequence of the reclamation of so many of its favourite breeding-grounds, the draining of marshes, and the cultivation of swampy wastes, the Redshank is less numerous in summer in England than was formerly the case. In autumn the coasts swarm with this bird, migrants from more northern breeding-places; but in spring the majority are compelled to leave, not being able to find a suitable summer residence. This bird seems much attached to its quarters, and often stays to breed in cultivated districts if they happen to be flooded. In some places they return regularly to rear their young in their ancient home, even though the marshes have given place to fields, and green crops have replaced the reeds, rushes, and other swamp vegetation of former years.

The Redshank is one of the first of the numerous Waders that all winter have enlivened many a broad acre of uninteresting mud and salt-marsh, to quit them in spring and return to its breeding-grounds. If the season be open its pleasant cries may be heard on the broads and marshes as early as the middle of February, but a more usual date is the beginning of March. Sometimes the Redshank has not to journey far to its breeding-grounds, merely seeking the open broads and fens close to the shore, or the swampy moors almost within sight of the coast; but it often goes for some considerable distance inland, visiting the banks of mountain-lochs and the pools of water on the moors. It is a lively, interesting bird, and its habits always have a charm for the naturalist. It is ever on the alert, and the least alarm will cause it to rise whistling in the air, where it often flies round and round over the intruder's head, rousing all the birds that may happen to be within hearing. A very graceful bird it looks as it trips round the margin of the water, or wades into the shallows, or stands lightly poised on some tuft of herbage, swaying its body up and down as it anxiously keeps on the look-out for danger. Its flight is rapid and erratic, as if the bird were undecided as to which course it should take, darting from side to side, its long wings being moved regularly. It sometimes skims along for a short distance before alighting, and often elevates its wings before finally closing them.

In summer the food of the Redshank is composed of worms, insects and their larvæ, and small land-shells. It is said to feed on caddis-worms, casting up their cases in pellets, and it may possibly eat various wild fruits. In winter its fare is more confined to marine animals, crustaceans, small mollusks, sand-worms, &c. The call-note of the Redshank is a loud *tyü, tyü*. At the nest, in addition to its call-note, its alarm-note of *tyik, tyik* is constantly heard.

The breeding-season of the Redshank commences in April, and fresh eggs may be obtained from the beginning of that month to near the end of May. Saxby says that in Shetland he has never seen the eggs earlier than the 13th of May. In Northern Europe the laying-season is later; and I have taken fresh eggs on the 22nd of June in the extreme north of Norway. The Redshank is a very sociable bird during the breeding-season, and numbers of its nests may be found in a small area of suitable ground. In the pairing-season the cock bird often soars into the air, and serenades his mate with a trilling sound, or amorously displays his charms by bowing and strutting, opening and closing his wings, and spreading his tail. At this season he sometimes alights on trees or even a post; and Stevenson records instances of a bird of this species performing various manœuvres of courtship as he ran along the top rail of a gate. The site of the nest is on the ground, often in the centre of a grass tuft, or beneath the shade of a tall weed or little bush of heather. The nests are generally cunningly concealed, and arched over by the surrounding herbage, which falls in natural pendants over them. Sometimes a site is chosen amongst the drifted rubbish above high-water mark. The nest is very slight: in many cases the centre of the tuft is trodden down into a receptacle for the eggs, but at other times a few dead bents, straws, or scraps of moss, heath, or reed are placed as a lining to the selected hollow. The eggs are four in number, rather large for the size of the bird, and pyriform in shape. They vary in ground-colour from very pale buff to rich ochraceous buff, and are spotted and blotched with rich dark-brown surface-markings, and with underlying spots of paler brown and grey. On some eggs a few streaky lines of dark brown are pencilled on the large end. Most of the large markings are on the large end of the egg, and some specimens are more finely and handsomely spotted than others. They vary in length from 1·9 to 1·65 inch, and in breadth from 1·3 to 1·17 inch. They are not easily confused with the eggs of any other British bird, being yellower in colour than those of the Ruff or Great Snipe, which they somewhat resemble. Only one brood appears to be reared in the year.

The Redshank is a very wary bird when its breeding-grounds are intruded upon. At the first alarm it quits its eggs, and flies in circles, screaming overhead, sometimes performing various aerial evolutions. When the young are hatched the old birds become even more anxious. As soon as the young are able to fly, the Redshank quits the inland moors and marshes, and seeks the coast, frequenting in most abundance the extensive salt-marshes and mud-flats at the mouths of large rivers. As the season advances, the resident Redshanks are increased in numbers by migratory birds from the north; the flocks become larger as these migrants haunt the coast for some time ere passing on again. It is a

pretty sight to watch a flock of these sprightly birds tripping daintily over the mud or marsh, their pure white under plumage contrasting strongly with their bright orange-red legs. They are almost constantly in motion, running here and there, pattering about the soft mud, boring into it with their slender bills in search of food, or snapping at a passing insect. Numbers of Redshanks are often caught in the flight-nets on the broad salt-marshes on the Lincolnshire coast. In autumn and winter this bird often congregates with other species, especially with Dunlins and Godwits. The Redshanks are the sentinels of the coast, and never fail to betray the approach of danger to all the wildfowl congregated in their vicinity. Numbers are shot in winter for food, but their flesh is only of poor quality.

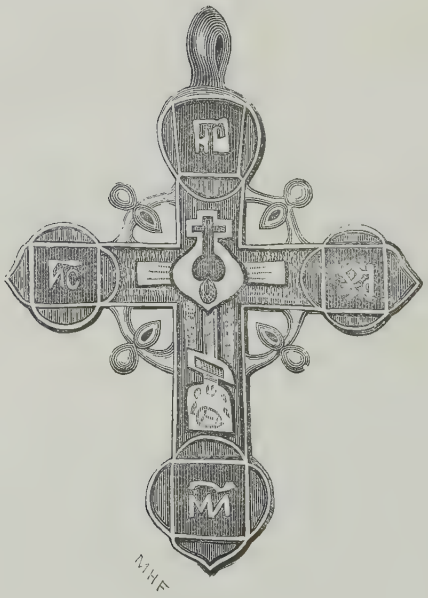
In this species males do not differ from females in the colour of their plumage. At all ages and seasons the rump is white; the upper tail-coverts and tail are white barred with dark brown; and the terminal portion of the tail-feathers is suffused with chestnut. Neither do the flight-feathers vary with age or season, the outer primaries being brown, the inner primaries brown at the base, and white marbled with brown towards the tip, whilst the secondaries are pure white, with concealed marbled bases. The axillaries and under wing-coverts are always white.

The adult in breeding-plumage has the rest of the upper parts dark brown, barred, streaked, and spotted with buffish grey; the underparts are white, profusely streaked with dark brown on the chin, throat, and breast, and sparingly so on the belly, and barred with the same colour on the flanks and under tail-coverts. Bill orange, shading into black at the tip; legs and feet orange-red, claws black; irides hazel. After the autumn moult the head, mantle, scapulars, innermost secondaries, and the wing-coverts are brown; the outer webs of the innermost secondaries and the greater and median wing-coverts have narrow white margins, and are spotted with dark brown. The whole of the underparts are pure white, with a few slight streaks on the breast, flanks, and under tail-coverts. In the young in first plumage the feathers of the upper parts (except those already mentioned, which do not vary) are brown, margined with buffish-white spots, each spot being emphasized with an obscure black base, whilst the colour of the underparts is exactly intermediate between those of the adult in summer and the adult in winter plumage *. Birds of the year are scarcely distinguishable from adults in winter plumage, except that some of the feathers of the upper parts have narrow white margins. In

* Dresser's male in autumn of the Common Redshank, figured on plate 568, is unquestionably a young bird in first plumage. As usual, he gives no explanation of the changes of plumage which the bird he describes undergoes. In this species the moult from young in first plumage to birds of the year takes place in September, earlier and quicker than is usual with Sandpipers. It is therefore probable that Redshanks assume the breeding-plumage and breed in their first spring.

the young in down the upper parts are rich buff mottled with black, and the underparts are pale buff.

In winter plumage the Redshank, the Greenshank, and the Dusky Redshank somewhat resemble each other, but may be at once distinguished by the colour of the secondaries. In the Redshank they are nearly pure white, in the Dusky Redshank they are white barred with brown, and in the Greenshank they are plain brown.



TOTANUS FUSCUS.

DUSKY REDSHANK.

(Plate 32.)

Tringa totanus ruber, Limosa fusca, } *Briss. Orn.* v. pp. 192, 277 (1760).
Scolopax fusca, *Linn. Syst. Nat.* i. p. 243 (1766); **et auctorum plurimorum**—(*Naumann*), (*Temminck*), (*Dresser*), (*Saunders*), &c.
Scolopax maculata, *Tunstall, Orn. Brit.* p. 3 (1771).
Scolopax cantabrigiensis, *Lath. Gen. Syn. Suppl.* i. p. 292 (1787).
Scolopax nigra, Scolopax curonica, Tringa atra, } *Gmel. Syst. Nat.* i. pp. 659, 669, 673 (1788).
Scolopax natans, *Otto, Uebers. Buff. Vög.* xxvi. p. 234 (1797).
Totanus maculatus (*Tunstall*), Totanus fuscus (*Linn.*), Totanus natans (*Otto*), } *Bechst. Orn. Taschenb.* pp. 284, 286 (1803).
Tringa longipes, *Leisl. Nacht. Bechst. Naturg. Deutschl.* ii. p. 189 (1813).
Totanus raii, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 31 (1816).
Erythroscelus fuscus (*Linn.*), *Kaup, Natürl. Syst.* p. 54 (1829).

The Dusky or Spotted Redshank is a somewhat rare visitor to the British Islands on spring and autumn migration, occurring most often at the latter season. It is frequently met with on the low-lying eastern coasts of England, but is only a rare straggler to the west. In Scotland it occasionally strays to the eastern coasts as far north as Orkney, but is totally unknown in the west. Its visits to Ireland are equally rare and uncertain; in Thompson's time only one example had been recorded, but since 1867 two other specimens have been obtained and several birds seen in the Moy estuary.

The Dusky Redshank is not known with certainty to breed anywhere south of the Arctic circle *, but on the tundras above the limit of forest-growth it breeds from Lapland to Behring's Straits, though nowhere very abundantly. It has not been recorded from Greenland, Iceland, or the

* Sabanaeff says that the Dusky Redshank breeds in the government of Moscow and in the Ekatereenberg district; but no reliance can be placed on this statement, or on the equally improbable one that the Knot and the Little Stint breed in the latter district—assumptions which are no doubt solely founded upon the fact that the birds are seen in these districts in summer plumage in May and June. Severtzow's statement that it breeds in Turkestan is equally unreliable, because he says that it breeds in the cultivated region below four thousand feet altitude. If it breeds at all in Turkestan, which is not impossible, the district it chooses is most likely that above the limit of forest-growth, from ten to fourteen thousand feet above the level of the sea.

Faroes. On migration it passes in spring and autumn not only along the Atlantic and Pacific coasts (including Japan), but also across country by most if not all of the well-known routes of migration. It winters in the basin of the Mediterranean, and in various parts of Africa north of the Equator, and in India, Burma, and China. It has also been said to have strayed during winter as far as the Cape Colony, Ceylon, and the Aleutian Islands. It is not known that eastern examples of this species differ in any respect from western birds. It has no very near ally either in the eastern hemisphere or on the American continent.

The migrations of the Dusky Redshank from its winter-quarters to its northern breeding-grounds take place somewhat late in spring. It crosses the Mediterranean from the middle of March to the middle of May. It makes its appearance in Denmark late in April, and on the British coasts is usually observed at that date or early in May. The return migration commences in August, at which date a few often make their appearance on the English coasts and Denmark, and it lasts through September and October.

The Dusky Redshank is not so much of a shore-bird as the Common Redshank, and is rarely found upon the coast except at the two seasons of migration. It loves to haunt inland marshes and the vast swampy grounds near large rivers, where the water lies in small pools. It is also partial to the low banks and dry parts of the beds of rivers. Its habits do not differ much from those of the other Waders. It runs along the marshy shores or wades into the shallow water in search of food. It is rather shy, and when alarmed generally flies off for some considerable distance. Its flight is rapid, and, as is customary with so many wading birds, it sometimes skims along before it alights. During migration it keeps in small parties and flocks, which do not scatter much whilst feeding. It is said to be fond of wading, and when it goes beyond its depth to swim with ease, sitting gracefully on the water and bowing its head, like a Phalarope, with every stroke of its feet. When wounded it has been known to dive for some distance.

The food of the Dusky Redshank consists of worms, insects of various kinds, crustaceans, and small shells; it is also said to feed on fish- and frog-spawn, and possibly eats various small wild fruits in summer. Its ordinary note is a shrill clear whistle, closely resembling that of the Redshank. Naumann expresses it as *tyuit* pronounced as one syllable, and at the nest its note was likened by Wolley to *tjeuty*. It probably does not differ much from that of the Redshank.

The eggs of the Dusky Redshank were first made known to British ornithologists by the indefatigable Wolley, who obtained them in Lapland. He communicated the details of his discovery to Hewitson, who published them in his 'Eggs of British Birds,' and figured three varieties. During

his first summer in Lapland he was unsuccessful in finding the nest; but his interest was continually excited by hearing the note, occasionally seeing the bird, and listening to the information respecting it supplied to him by the Finns, who disliked it on account of its habit of flying about in the air uttering its loud note, and alarming any deer they might be stalking. Wolley found that it arrived at its breeding-grounds as soon as the snow had melted, and began to prepare for its nesting-duties without any delay. It frequented the open spaces in the forest, often far from water, especially choosing spots where the timber had been burnt and where the vegetation was scanty. The birds were scattered up and down so locally, that he only saw two or three pairs in a day's walk.

The nests were often placed on rising ground, frequently near the tops of the hills, and at a long distance from any marshy ground, in open places surrounded with fir trees; they were slight depressions in the ground, which was covered with short heath and other small plants growing amongst reindeer moss, and were only lined with a few dead spines of the Scotch fir. The bird often sat so closely as to almost tempt him to try and catch it; and its white rump was very conspicuous as it sat brooding on its eggs, with its neck drawn in. When disturbed it either rose at once or ran a little distance before doing so, and then flew round, now and then uttering its note. Sometimes he saw it perch on the top of a neighbouring tree. The eggs were laid at the end of May. When the young are hatched, Wolley found that the old bird displayed its anxiety much more, hovering over him, or standing very near, nodding its head and opening and closing its bill. It is very wary during the breeding-season, and he never succeeded in watching it to its nest; all those he found were stumbled upon by accident.

The eggs of the Dusky Redshank are four in number, and are laid late in May or during the first half of June, sometimes later, according to season; they are very handsome, and vary in ground-colour from pale green to pale brown, heavily blotched and spotted with rich sepia-brown, and with underlying markings of violet-grey and brownish grey. On many eggs a few very dark brown hair-like lines and scratches occur on the large end. Some eggs are so richly marked as to hide almost all the large end; others are more evenly spotted over the entire surface. The markings are generally bold and very clearly defined. The eggs are pyriform in shape, and vary in length from 1·95 to 1·8 inch, and in breadth from 1·35 to 1·25 inch. They cannot readily be confused with those of any other British bird. Eggs of the Great Snipe perhaps resemble them most closely, but they are never so green, and are, on an average, slightly smaller. Only one brood appears to be reared in the year, and Wolley says that as soon as the young are hatched they are taken to the marshes by their parents.

The adult male Dusky Redshank in full breeding-plumage is a very

handsome bird. The entire head, neck, and underparts are very dark slate-grey, barred with white on the flanks, the centre of the belly, and the under tail-coverts; the axillaries and under wing-coverts are pure white, the latter spotted with brown near the edge of the wing. The rest of the upper parts are slate-grey, spotted and barred with greyish white, except the lesser wing-coverts, outermost primaries, and primary-coverts, which are brown, and the rump, which is white. Bill black, red at the base of the lower mandible; legs, feet, and claws dark reddish brown; orbits white, irides hazel. The female very closely resembles the male in colour, but shows more white on the underparts. After the autumn moult the head, hind neck, mantle, scapulars, and innermost secondaries are uniform greyish brown, the margins of the latter having dark brown and white spots; and a white streak passes over the eye. The wings, wing-coverts, rump, upper tail-coverts, and tail remain as in summer plumage, but the whole of the underparts are pure white, slightly clouded with greyish brown on the breast and flanks. The legs and feet also change colour to orange-red. Young in first plumage closely resemble adults in breeding-plumage, but are browner on the head and neck, duller in colour, and more spotted; the underparts are greyish white, barred and streaked with brown; the lores are very dark brown, and a white streak extends over the eye. Birds of the year are intermediate in colour between young in first plumage and adult in winter plumage. Young in down resemble those of the Redshank, but the ground-colour is somewhat darker.

At all ages and seasons the Dusky Redshank may be distinguished from the Greenshank and the Redshank by the colour of its secondaries, which are white barred with brown.

TOTANUS GLOTTIS *.

GREENSHANK.

(Plate 29.)

Limosa grisea, *Briss. Orn.* v. p. 267 (1760).
Scolopax glottis, *Linn. Syst. Nat.* i. p. 245 (1766, winter plumage); **et auctorum plurimorum**—*Tunstall*, *Latham*, (*Bechstein*), *Turton*, (*Leach*), (*Forster*), (*Gould*), (*Horsfield*), (*Blyth*), (*Middendorff*), (*Layard*), (*Schlegel*), (*Jerdon*), (*Newton*), (*Swinhoe*), (*Heuglin*), (*Salvadori*), (*Legge*), (*Walden*), (*Hume*), &c.
Scolopax nebularius, *Gunner*, *Leem. Beskr. Finm. Lapp.* p. 251 (1767).
Scolopax cineracea, *Lath. Gen. Syn. Suppl.* i. p. 292 (1787).
Scolopax canescens, *Gmel. Syst. Nat.* i. p. 688 (1788).
Totanus glottis (*Linn.*), *Bechst. Orn. Taschenb.* ii. p. 287 (1803).
Totanus fistulans,
Totanus griseus (*Briss.*), } *Bechst. Naturg. Deutschl.* iv. pp. 241, 249 (1809).
Totanus chloropus, *Meyer*, *Taschenb.* ii. p. 371 (1810).
Limicula glottis (*Linn.*), *Leach*, *Syst. Cat. Mamm. &c. Brit. Mus.* p. 32 (1816).
Glottis chloropus (*Meyer*), *Nilsson*, *Orn. Suecica*, ii. p. 57 (1821).
Limosa totanus (*Linn.*), *apud Pall. Zoogr. Rosso-Asiat.* ii. p. 183 (1826).
Glottis nivigula, *Hodgs. Gray's Zool. Miscell.* ii. p. 36 (1831).
Totanus glottoides, *Vigors*, *Proc. Zool. Soc.* 1831, p. 173.
Limosa glottoides (*Vigors*),
Totanus horsfieldii, } *Sykes*, *Proc. Zool. Soc.* 1832, p. 163.
Glottis floridanus, *Bonap. Comp. List B. Eur. and N. Amer.* p. 51 (1838).
Glottis canescens (*Gmel.*),
Glottis vigorsii,
Glottis horsfieldii (*Sykes*), } *Gray*, *List Birds Brit. Mus.* iii. p. 99 (1844).

The Greenshank is a regular, though not very abundant, summer migrant to the British Islands, where it has been obtained in almost every county. It is of course most numerous on the low-lying coasts of the

* Gray was probably the first person to rake up a new name for the Greenshank (List Birds Brit. Mus. iii. p. 99, 1844), and most subsequent ornithologists, like a flock of sheep, always ready to follow a lead, whether good or bad, adopted it. Now that they find there are two older names, it will have to be thrown aside. The diagnosis of *Scolopax glottis* in the 'Systema Naturæ,' as well as in the 'Fauna Suecica,' is not every thing that could be wished. The colour of the legs is described as greenish, which narrows the choice to the Greenshank and the Bar-tailed Godwit, both of which are otherwise represented in the two works. The statement that the base of the under mandible is red undoubtedly applies more correctly to the Bar-tailed Godwit than to the Greenshank; but examples of the latter, probably birds of the year, frequently show this peculiarity in the dried skin. The greater number of the diagnoses of Linnæus are hopelessly bad, and the only way to retain his names is to give those which have been generally accepted the benefit of the doubt. Ornithologists will find that there is no rest for the soles of their feet until they adopt the common-sense rule of accepting the name *auctorum plurimorum*.

eastern counties, whence the greater number pass on to their breeding-grounds in Northern Europe; but a few retire to the mountain-lochs of Scotland to breed. It is a well-known bird in Ireland; but though the country seems well adapted to it, it has not yet been found nesting there. Its breeding-places in Scotland are local and chiefly situated in the Highlands and in the Hebrides; but it nests as far south as the counties of Perth and Argyle.

The geographical distribution of the Greenshank very closely resembles that of the Dusky Redshank; but in the west the breeding-range extends further south, and in the east not nearly so far north, whilst the winter range is somewhat greater. The Greenshank has not been recorded from Greenland, Iceland, or the Faroes; but it is a regular summer visitor to the fells of Norway, Sweden, and Lapland. In the valleys of the Petchora and the Obb it appears to breed from lat. 60° to lat. 66°, which is probably its summer range throughout Siberia, as it only passes through Lake Baikal and the valley of the Amoor on migration; and Middendorff did not find it on the tundras, but only on the Stanavoi mountains *. It passes along the coasts of Europe and Eastern Asia, including the Japanese islands, on migration, as well as the recognized inland routes, and winters in the basin of the Mediterranean, on the coasts of Africa as far south as the Cape, in India, Ceylon, Burma, China, the Malay archipelago, and Australia. The winter range of this species is very extended, stragglers having occurred on Mauritius, Norfolk Island, in Chili, at Buenos Ayres, and in Florida. The Greenshank has no nearer allies than the Redshank and the Marsh-Sandpiper.

The Greenshank begins to leave its winter-quarters in the basin of the Mediterranean early in spring. It passes Malta and South Russia in March, France in April, and arrives on the British coasts at the end of that month and early in May, and Collett says that it arrives in South Sweden in the last half of May. The autumn migration begins in August in Holland, and in September in England, lasting throughout those two months and even until early in October. Stragglers have been known to remain during the winter on our coasts; but this is very exceptional.

The summer-haunts of the Greenshank are on the mountain-heaths, on the broad moors which are studded with lochs and interlaced with streams and pools. On its arrival in this country it frequents the coast for a short time, showing preference for shores that are low and muddy; but it soon leaves for its summer-quarters amongst the hills. Both in spring and autumn it sometimes congregates into small flocks; but it is more often seen in pairs. It is a very graceful active bird, and runs over the mud-

* It is impossible to accept Severtzow's statement that this bird breeds in Turkestan; it may do so at a high elevation, but certainly not in the cultivated region which Severtzow assigns as its breeding-range.

flats and sands with easy activity, sometimes wading into the shallow water, or standing motionless for a long time on a large stone or rock. It is often flushed from quiet pools, little creeks, and rocky coasts at low water. It is a very shy bird, and seldom fails to betray its whereabouts by rising into the air and calling loudly, even before the observer is within half a mile of it. On the wing its motions are rapid and uncertain. It often twists from side to side in an erratic manner, and, with its long wings beating rapidly, it is soon out of danger. It drops suddenly, runs a little way, then stands and vibrates its body in a remarkable manner. There is something very impetuous about the flight of this interesting bird, and, as it is usually accompanied by the loud shrill double note of *tyü-tyü*, it becomes the more striking and impressive. The Greenshank often perches on trees, especially in the breeding-season.

The food of the Greenshank is largely composed of insects and their larvæ, for which it not only searches in the mud, but amongst the droppings of cattle on the banks of the lakes. It picks them from the stems of grass and reeds, and snaps at them on the water or when flitting past in the air. Naumann says that it eats tadpoles, and a small frog has been found in its stomach. It also eats frog- and fish-spawn, small shells, worms, and when on the shore crustaceans and other small marine animals. Mr. Swaysland has taken five or six small minnows, about one and a half inches in length, out of a bird shot at Brighton.

In Scotland the breeding-season of the Greenshank begins early in May, and its eggs are laid during the last half of that month. The Greenshank is a wary watchful bird, and its nest is only discovered either by accident or after the closest search. In Lapland the eggs are laid in the first half of June. It is not at all social in the breeding-season, and scatters itself in pairs at long and irregular distances. Its nest is cunningly concealed amongst the heath and short herbage, and is very slight, being a mere depression in the ground, lined with a few bits of dry grass or withered leaves. Sometimes the nest is placed quite close to the water, in a similar position to that usually chosen by the Common Sandpiper, but more generally it is in situations similar to those selected by the Golden Plover or the Dunlin. Sometimes the nest is built in a tuft of grass, or on a little piece of higher ground surrounded with marsh. The eggs are four in number, placed with their pointed ends inwards. They vary from creamy white to buff in ground-colour, blotched and spotted with rich dark brown, and with underlying shell-markings of pinkish brown and grey. The large dark rich blotches are generally on the large end of the egg, and often form a zone. Some eggs have the markings no larger than a large pea, and equally distributed over the entire surface. The underlying markings are large, and partake of the character of blotches as well as spots. The eggs vary in length from

2·05 to 1·82 inch, and in breadth from 1·4 to 1·3 inch; they are not easily confused with those of any other British species. Only one brood is reared in the year. My son wrote the following notes on this bird during a visit to Skye in 1884:—

"The only colony of Greenshanks in Skye is in the south-west of the island, at the foot of the Cullin Hills, where about three or four pairs of birds breed every year. Last spring I explored the whole of the southern part of the island in search of this bird, and succeeded in finding the breeding-grounds of two pairs. I also heard of a third pair, the eggs of which had been taken by a shepherd a fortnight before I arrived. The first day I saw this bird was on the 11th of June, a regular Skye day! When I awoke in the morning, about six o'clock, and looked out of my window towards Scuir-na-gillean, which was just opposite, it was quite fine, and I got into bed again for another hour's sleep, thinking over my chances of finding the eagerly wished-for nest and eggs of the Greenshank; but at seven o'clock, when I got up to dress, I could see the mist coming down each valley in the same way that the Engadine 'fish' creeps down the valleys of St. Moritz and Pontresina, and my heart sank within me. By half-past seven the mountains were completely hidden from view, and the rain was blowing down the valley from the west in torrents. I had my breakfast and set out for the keeper's house, determined not to be done out of my day's bird-nesting by the variabilities of the Skye climate; and having talked over the various possibilities of it clearing up before noon, we determined to start at once on our expedition. We were a party of three. After we had walked for about two miles through the thick piercing sleet, the wind suddenly dropped, the mist disappeared to the place from whence it originally came, the rain stopped altogether, Scuir-na-gillean was once more visible, the sun sent out its welcome rays, and in half an hour it was as fine a day as any ardent ornithologist could wish for. So much for the Skye climate; now for the Greenshanks! By ten o'clock we had reached the place where the keeper suspected they bred, although he had never succeeded in finding their nest. It was near a small loch, situated at the foot of Scuir-na-gillean, surrounded on all sides by heather and a few reeds. At one end there was a collection of small pools of water. We stood for some time on the look-out for the bird or its note, but could not see or hear anything of either, and I began to think that the bird did not breed there at all. After walking about the loch in vain search for about a quarter of an hour I fired off my walking-stick gun, to see if I could scare the birds, and immediately two, which I recognized at once as Greenshanks, got up from the far end of the loch and began flying around us in the most disturbed manner, uttering their long shrill note, between the cry of the Redshank and a broken-winded Whimbrel. Both birds seemed extremely concerned,

so we knew at once that they must have eggs or young somewhere very close at hand. One of the birds, I think the male, now and then settled on the top of an adjoining hillock, slightly raising his wings, and then giving vent to his feelings, after the manner of the Golden Plover; whilst his mate kept swooping down on us near the water, repeating her note with great rapidity. After hunting about the banks of the loch for an hour or so, vainly trying to find the nest, the old birds keeping up their excitement all the time, I at last discovered, crouching by the side of a clump of heather, about two feet from the water, two little grey woolly birds, striped above with black like a zebra, with immense long green legs folded up beneath them. On seeing me they began to utter a short plaintive squeak, which soon brought the parent birds within twenty yards of us, the female falling to my walking-stick gun. The male then flew off to a neighbouring hillock, and, having settled on the top, began to bewail the loss of his mate in his shrillest notes. The birds were extremely wild, though daring; and during the hour that we took to find the young they only once came within shot. The Greenshank sometimes can be seen hovering in the air, and then again swooping down over the water, at the least alarm turning sharply round and darting off."

As soon as the young are fledged the old birds lead them to the adjoining coasts, where they remain until the time of their departure southwards. At this season they obtain their food almost exclusively from the shore, running over the mud-flats and sands, probing them with their long beaks in search of worms and crustaceans. When searching the mud for food, Mr. Harting observed the Greenshank working its bill from side to side. At high water it sometimes visits the pastures near the sea, and often waits on the salt-marshes for the receding of the water.

In the adult male Greenshank, in breeding-plumage*, the head is white streaked with black; the feathers of the mantle, the scapulars, and innermost secondaries are black, with interrupted grey margins; but in the course of the summer the grey changes to almost white on the back and scapulars, and is abraded away on the innermost secondaries, leaving them

* Saunders has reproduced Yarrell's statement that the summer plumage of the Greenshank is assumed by a change in the colour of the feathers and not by a moult. There is no reason to suppose that this bird forms an exception to the rule which governs the changes of plumage in this family. A few feathers are probably retained in spring and may change colour, as is usually the case; but in the Swinhoe collection is a skin of a Greenshank, dated Hankow, April, in which many primaries of each wing are in full moult, and some of the feathers of the back and a few of the innermost secondaries are still only half-grown. The rarity of early-spring examples of Waders in collections, and the unfortunate propensity of collectors to throw away birds in moult, under the mistaken idea that they are valueless, is probably the cause of this and similar errors.

with jagged edges; the wings and wing-coverts are nearly uniform dark brown; the rump is white; the upper tail-coverts are white, barred with dark brown; the two centre tail-feathers are grey, obscurely barred with brown, the remainder being white, more or less obscurely barred with brown. The underparts are white, streaked with dark brown on the throat, breast, and flanks, and slightly so on the axillaries, under wing-coverts, and the longest under tail-coverts. Bill black; legs and feet olive; claws black; irides hazel. The female differs from the male in having the black blotches on the upper parts much less conspicuous, being apparently in less complete adult plumage. After the autumn moult the black blotches on the feathers of the upper parts are reduced to sub-terminal margins, and the streaks on the underparts are confined to the sides of the neck and of the breast, the under wing-coverts, and the axillaries. Young in first plumage* have the feathers of the upper parts blackish brown, with very pale buff margins, and on the innermost secondaries and scapulars are obscure dark spots; the colours of the rump, upper tail-coverts, quills, and tail are the same as in the adult, but the bars on the centre tail-feathers are more conspicuous, because the ground-colour is white, but those on the axillaries are nearly obsolete. The spots on the

* In Dresser's 'Birds of Europe' there is a remarkable account of the changes of plumage in the Greenshank. It is not quite clear whether the writer thinks that this bird moults four times in the year, or changes the colour of its feathers without moulting at all. Whoever he was, he appears to have been well acquainted with Naumann's history of the habits of the Greenshank, but to have entirely overlooked that great ornithologist's account of its progress from youth to maturity. So far as it is possible to judge, the writer of the extraordinary article in question was absolutely ignorant of every thing connected with the Greenshank, except the information which a series of skins might afford. Being equally ignorant of the changes of plumage of the allied species, it is not surprising that he misinterpreted the facts which the skins ought to have taught him. The conclusions he appears to have arrived at are these:—The young in down moult at once into adult winter plumage, which gradually changes into the immature summer plumage of birds of the year after their first spring moult. Then follows the adult summer plumage, which gradually changes (the bird having presumably drank of the elixir of life in the meantime) into the dress of young in first plumage. The cycle is completed by a sudden jump into adult winter plumage, and these transformations are repeated every year. What a misfortune it is that the writer of this remarkable article could not renew his youth like the Greenshank, and reappear as a young author in first plumage! He would probably be careful not to dip his quills into the ink until he had either worked out the subject for himself or taken the trouble to read up some author who had done so. Articles of this kind are very amusing, but they must sorely puzzle the young student—though in most cases his bird-stuffer, even if he be only a country barber, will be quite capable of correcting such childish blunders. It is scarcely possible to imagine any person so ignorant of his subject voluntarily undertaking the task of teaching others. Perhaps the explanation may be that we have here another case of too many cooks; but, to judge by the quality of the broth, it must have been the handiwork of the scullery-maid.

underparts are much less distinct than in breeding-plumage, but much more so than in winter dress, extending across the throat and far on the sides of the breast. Birds of the year are intermediate between young in first plumage and adult in winter plumage. Young in down are pale chestnut-grey, marbled with black on the upper parts, and nearly white on the underparts.

The uniform brown secondaries of the Greenshank serve to distinguish it at all ages and seasons from the Dusky Redshank and the Redshank.

PHALAROPE'S NEST.

TOTANUS RUFUS.

BAR-TAILED GODWIT.

(Plate 29.)

Limosa grisea major, *Briss. Orn.* v. p. 272 (1760, winter plumage).

Limosa rufa, *Briss. Orn.* v. p. 281 (1760, summer plumage); *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 32 (1816); **et auctorum plurimorum**—*Naumann, Temminck, Selby, Yarrell, Bonaparte, Lichtenstein, Fleming, Jenyns, Meyer, Nilsson, Degland & Gerbe, Middendorff, Swinhoe, Wolley, Blakiston, Wright, Hume, Russow, Alston & Harvie-Brown, Brandt, Schalow, Reichenow, Cabanis, Homeyer,* &c.

Limosa rufa major, *Briss. Orn.* v. p. 284 (1760, winter plumage, *ex Linn. et Willughby*).

Scolopax lapponica, *Linn. Syst. Nat.* i. p. 246 (1766, summer plumage).

Scolopax ægocephala, *Linn. Syst. Nat.* i. p. 246 (1766, winter plumage, *ex Willughby*).

Scolopax leucophæa, *Lath. Ind. Orn.* ii. p. 719 (1790).

Totanus ægocephalus (*Linn.*), Totanus leucophæus (*Lath.*), *Bechst. Orn. Taschenb.* ii. pp. 288, 289 (1803).

Totanus ferrugineus, *Meyer, Taschenb.* ii. p. 374 (1810).

Limosa meyeri, *Leisler, Nachtr. Bechst. Naturg.* ii. p. 172 (1813).

Limicula meyeri (*Leisl.*), Limicula lapponica (*Linn.*), *Vieill. N. Dict. d'Hist. Nat.* iii. pp. 249, 250 (1816).

Limosa jadreca, Limosa noveboracensis, Limosa ægocephala (*Linn.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 32 (1816).

Fedoa meyeri (*Leisl.*), Fedoa rufa (*Briss.*), Fedoa pectoralis, *Steph. Shaw's Gen. Zool.* xii. pt. i. pp. 75, 77, 79 (1824).

Limosa ferruginea (*Meyer*), *Pall. Zoogr. Rosso-Asiat.* ii. p. 180 (1826).

The Bar-tailed Godwit has never been known to breed in any part of the British Islands, although it has been suspected to do so on some of the wild and lonely Hebrides. It is principally known as a visitor on migration, appearing in spring and autumn, most numerous at the former season on the low-lying coasts south of Spurn Point. It visits in more or less abundance all the coasts of the British Islands, being most frequent on those that are low and sandy, and commoner in the east than in the west of Great Britain. It visits the Orkneys and Shetlands on migration, as well as the Channel Islands. A few stragglers occasionally remain during winter; and it sometimes wanders out of its usual course when on migration, and visits the inland counties. In the same manner a few often remain on our coasts all summer, probably non-breeding birds. In Ireland it is said to be more abundant than in Scotland.

The Bar-tailed Godwit is entirely confined, during the breeding-season, to the Siberian tundras above the limit of forest-growth from Lapland in the west across Behring's Straits into Alaska in the east. It has not been

recorded from Greenland, Iceland, or the Faroes. The migrations of the Bar-tailed Godwit are somewhat peculiar. The mountains and deserts of Central Asia appear to present to it an impassable barrier. It is doubtful whether it is a regular visitor to the Indian peninsula east of the Indus *, and it has never been recorded from Burma. The Bar-tailed Godwits breeding in the lower valleys of the Obb and the Petchora migrate down the valley of the Tobol into that of the Ural, or down the valley of the Kama into that of the Volga, to the Caspian, whence they cross to the Mekran coast, some possibly reaching Eastern Africa. Those breeding in North-west Russia and Lapland follow the coasts of Europe, and winter in the basin of the Mediterranean, principally in North Africa; they occasionally stray as far as the Canary Islands, but on neither coast of Africa do they appear to cross the equator. The eastern Bar-tailed Godwits pass the coasts of Japan, Mantchooria, and China on migration, and winter in the islands of the Malay archipelago, Australia, the New Hebrides, Norfolk Island, and New Zealand.

The result of this interrupted area of distribution during winter has been the establishment of an eastern and a western race. The former has the dark centres of the feathers of the rump more numerous and larger than is the case with the latter, and may be distinguished as *Limosa lapponica uropygialis* †, presenting a parallel case to that of the eastern and western forms of the Whimbrel, though in the two forms of the Curlew these differences are reversed.

* Dresser's statement that Captain Bulger records it as "not uncommon at Mulcibon, Selham, and Ras Dowra, in Sikkim," is evidently a corruption of the original text of "Further Notes on the Birds of Morocco" (Tyrwhitt Drake, 'Ibis,' 1869, p. 154), where it remarked of *Limosa lapponica*, "not uncommon at Mulei-bou-Selham and Ras-dowra." It is probably an accidental visitor to the Himalayas (Blyth, 'Ibis,' 1865, p. 36).

† The synonymy of the eastern form is as follows:—

Limosa baueri, *Naum. Vög. Deutschl.* viii. p. 429 (1836, *descript. null.*).

Limosa brevipes, Limosa australasiana, } *Gray, List Birds Brit. Mus.* iii. pp. 95, 96 (1844, *descript. null.*).

Limosa lapponica, var. novæ zealandiæ, *Gray, Voy. Ereb. and Terror, Birds*, p. 13 (1846).

Limosa uropygialis, *Gould, Proc. Zool. Soc.* 1848, p. 38; **et auctorum plurimorum**—*Gray, Reichenbach, Macgillivray, Bonaparte, Swinhoe, Schlegel, Finsch, Hartlaub, David, Walden, Taczanowsky, Ramsay, Layard*, &c.

Limosa foxii, *Peale, U.S. Expl. Exp.* p. 231, pl. 65 (1848).

Gallinago punctata, *Ellman, Zool.* 1861, p. 7470.

It is impossible to say where these two forms meet, but most probably on the Taimur peninsula. An example which I obtained in the valley of the Yenesay is unquestionably the western form. Probably the Godwits found by Middendorff on the Taimur peninsula are somewhat intermediate, as he failed to notice any difference between them and examples obtained at Ochotsk. Dresser, who considers the two races specifically distinct, regards the Taimur-peninsula Godwits as the eastern species, remarking that "Middendorff especially refers to the barred rump." This is another of the numerous cases of mis-

The Bar-tailed Godwit is represented on the American continent by a nearly allied but perfectly distinct species, *T. fedoa*, which may always be distinguished by having the under wing-coverts and axillaries chestnut barred with black, instead of white barred with black.

The migrations of the Bar-tailed Godwit commence at Gibraltar as early as February, and continue through March and April. Irby gives the latest date at which he has seen it in spring as the 10th of May, and that of its first appearance in autumn as the 21st of September. Although it has to journey much further north to breed than its congener the Black-tailed Godwit, it seems to delay its departure to the last moment, working slowly up from the south so as not to reach its summer-quarters before the snow has melted. A few make their appearance in the British Islands in April, but the majority do not arrive until May. In autumn this bird is seen on the coasts of Holland from August to October; and the same dates apply to our islands, with the exception that it remains a little longer.

The habits of the Bar-tailed Godwit in spring differ somewhat from those of autumn. Most of the Godwits which pass our shores on their way to their breeding-grounds are adult birds, and are remarkable for their excessive wariness. Some of the flocks which pass along the coast of Norway are very large, others, which linger on the Scandinavian coast as late as June and July, are smaller, and consist probably of birds of the year, which are not yet mature enough to breed. Both are described as so wary as never to allow themselves to be approached within gunshot. In autumn, on the contrary, the Godwits which visit our shores are nearly all young inexperienced birds on their first journey, and are easily whistled within range and shot. They often migrate in company with smaller Sandpipers, especially with Knots and Dunlins. During its stay on our coasts the Bar-tailed Godwit seeks its food at low tide upon the sand and the mud, which it is constantly probing and scooping with its long slender bill. It walks daintily over the treacherous surface of the ooze, now and then running for a short distance or wading almost up to its belly in the pools which the tide has left. During high tide it seeks pastures where the grass is very short or comparatively dry bare places, where it often takes the opportunity of resting on one leg with its bill under its wing. In searching for food it often works its bill from side to side like an Avocet, or dabbles in the mud and water like a Duck. Shortly after its

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translation which detract so greatly from the value of this important work. What Middendorff does say is that all the *upper tail-coverts* were barred with blackish brown. This is invariably the case in both races, and in neither of them is the rump ever barred, the difference between the two being that of greater or less longitudinal striation. Examples of each race vary so much in this respect *inter se*, that it is impossible to regard them as more than subspecifically distinct.

arrival it is so unsuspicious of danger, especially if only one or two birds are together, that it may often be approached within a few yards. Its actions on the mud are very Curlew-like; and it often stands quite still for a long time, as if lost in thought. When disturbed it flies in a moderately quick manner, usually uttering an alarm-note as it rises. Before alighting again it often skims along with outspread wings for some distance. In all its habits it is a complete *Totanus*, walking sedately, and but rarely running—often wading into deep water, but only attempting to swim or dive when wounded. Its call-note resembles the syllables *kyă, kyă, kyă*. The alarm-note at the nest has not been described; but in the pairing-season it has a trill like most other Sandpipers.

The food of the Bar-tailed Godwit in autumn and winter consists of sand-worms, crustaceans, insects, small shells, and other minute marine animals. Its feeding-time commences generally at high water, as soon as it can get on the mud, and it gradually follows the retreating tide, and is then driven back again. It often reposes on sand-banks and mud-flats at the mouths of rivers, congregating with Plovers, Dunlins, Knots, and other wading birds. In summer its food consists more or less of insects, worms, &c., which it obtains in its muddy haunts.

But little is known respecting the breeding-habits of the Bar-tailed Godwit. It rears its young on the vast northern moors and the swampy portions of the Arctic tundra. Wolley, who obtained the eggs of this bird in 1858, informed Hewitson that it bred in marshes, chiefly near to mountains, and that its nest was very difficult to find. Its breeding-season is at the end of May or early in June. The eggs Wolley obtained in Finland were taken on the 29th of May. The nest is very slight, a little dry grass or other herbage placed in a depression in the ground, and the eggs are four in number. They are pale or dark olive-green in ground-colour, spotted and blotched with darker brown and with underlying markings of grey. Two eggs, supposed to be those of this bird, from the neighbourhood of Archangel, and taken on the 1st of June, 1880, are very boldly and handsomely blotched with rich brown, and one specimen is streaked with very dark brown on the large end. They vary in length from 2·39 to 2·05 inch, and in breadth from 1·5 to 1·43 inch. It is impossible to give any character by which the eggs of this bird may be distinguished from those of the much commoner Black-tailed Godwit, nor are they with certainty to be distinguished from eggs of Buffon's Skua. Of the actions of the birds at the nest, and similar interesting particulars concerning this bird's nidification, nothing has been recorded.

Bar-tailed Godwits are often caught in the flight-nets which are spread over the enormous mud-flats of the Lincolnshire coast. These birds migrate at night, and appear to fly at no great height. Dixon has known them to be most absurdly tame on this coast, often allowing him to

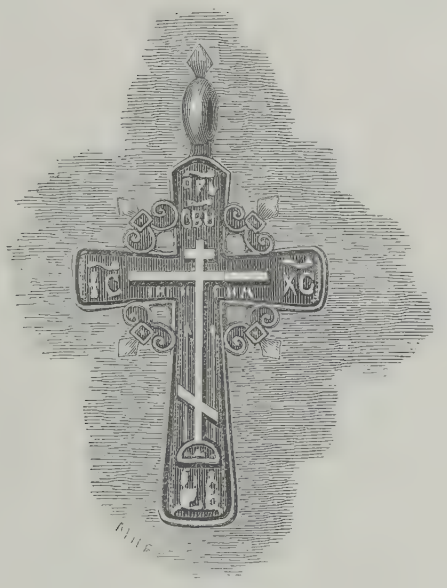
approach within a few feet as they stood utterly unmindful of his presence. They sometimes leave the mud-flats and repair to the drier land; and are very fond of frequenting the narrow dykes and streams with which these flats are intersected in all directions as soon as the tide has left them. When fired at, the birds often return after flying a little distance. As the season advances they become more wary.

The adult male Bar-tailed Godwit in breeding-plumage has the general colour of the upper parts dark brown, spotted with chestnut on the crown, mantle, scapulars, and innermost secondaries, and shading into chestnut on the back of the neck and sides of the head; the wing-coverts are greyish brown, with nearly white edges and dark shaft-streaks; the wings are dark brown, the secondaries and innermost primaries margined with white; the rump is white, the feathers in the middle with dark brown centres; the upper tail-coverts and tail are white, barred with dark brown. The general colour of the underparts is rich chestnut, with a few black streaks on the sides of the breast and flanks; the axillaries, longest under tail-coverts, and under wing-coverts are white, the two latter obscurely barred with brown. Bill dark brown, paler at the base; legs, feet, and claws black; irides hazel. In the female, the chestnut both on the upper and under parts is paler, and there are always numbers of feathers which are little changed in colour from those of winter plumage. After the autumn moult all trace of chestnut disappears from both the upper and under parts, the lower breast and belly are nearly pure white, and the throat and upper breast are greyish white with dark streaks, the feathers of the upper parts are greyish brown with pale edges and dark shaft-streaks, the wing-coverts, rump, and upper tail-coverts scarcely differing from summer plumage. A very important difference, however, presents itself in the colour of the tail, which is plain ash-grey, slightly marbled at the base *.

Young in first plumage differ from adults in winter plumage in having

* Yarrell appears to have copied Selby in asserting that the tail of the Bar-tailed Godwit was always barred, an egregious error which Saunders, apparently misled by Dresser, has failed to correct. The tail of the young in first plumage, and of the adult in summer plumage, is always barred. Adults in winter plumage have plain tails, but those of birds of the year occasionally show traces of bars. It is very extraordinary that a blunder of this kind should still be perpetuated, especially as Naumann describes and figures the adult in winter with the terminal half of the tail-feathers plain, and my friend Mr. Charles Murray Adamson had also pointed out the fact as long ago as 1881, in his book, 'Some more Scraps about Birds.' On page 41 he describes a mature female, shot in January, as having the tail plain ash-coloured; and on page 47 he says that "all mature birds have similar tails, and I think several of the accounts one reads of Black-tailed Godwits having been killed in winter are merely mature birds of the present bird." The tail was also accurately described by Hume in 1873 ('Stray Feathers,' i. p. 335), though he mistook the partially barred tail of the bird of the year for a sign of maturity.

the general colour of the upper parts much browner, especially on the scapulars and innermost secondaries, which are slightly suffused with chestnut; the tail is barred as in the adult in summer plumage; and the throat, breast, and flanks are suffused with buff. They migrate from their breeding-grounds in this dress, and during the winter gradually assume the plumage of birds of the year, of which they retain traces during their first summer, and which is slightly intermediate between young in first plumage and adults in winter plumage, but the underparts are more spotted. Young in down appear to be unknown.



TOTANUS MELANURUS.

BLACK-TAILED GODWIT.

(Plate 29.)

Limosa limosa, *Briss. Orn.* v. p. 262 (1760).
Scolopax limosa, *Linn. Syst. Nat.* i. p. 245 (1766).
Scolopax belgica, *Gmel. Syst. Nat.* i. p. 663 (1788).
Totanus limosa (*Briss.*), *Bechst. Orn. Taschenb.* ii. p. 287 (1803).
Actitis limosa (*Briss.*), *Illiger, Prodr.* p. 262 (1811).
Limosa melanura, *Leisler, Nachtr. Bechst. Naturg.* ii. p. 153 (1813); **et auctorum plurimorum**—*Naumann, Meyer, Nilsson, Temminck, Selby, Giglioli, Shelley, Severtzow, Bogdanow, Lichtenstein, Lord Lilford, Swinhoe, Elwes & Buckley, Goebel, Selby, Jenyns, Gould, Yarrell,* &c.
Limicula melanura (*Leisl.*), *Vieill. N. Dict. d'Hist. Nat.* iii. p. 250 (1816).
Fedoa melanura (*Leisl.*), *Steph. Shaw's Gen. Zool.* xii. pt. i. p. 73 (1824).
Limosa ægocephala (*Linn.*), *apud Fleming, Degland & Gerbe, Gray, Blyth, Bonaparte, Middendorff, Shelley, Sharpe & Dresser, Hume, Heuglin, Blanford, Macgillivray, Harting, Saunders, Irby,* &c.*

The Black-tailed Godwit is much rarer in the British Islands than the Bar-tailed Godwit. It formerly bred in small numbers in the fens and marshes of the low-lying eastern counties, but is now never known to do so. It occasionally visits the shores of England on spring and autumn migration, being most common on the east coast, where a few arrive on their way to or from Denmark *viâ* Heligoland. In Scotland it is much rarer, only accidentally straying to the west coast, and irregularly appearing on the east, where it has been observed as far north as the Shetlands. They only stay a short time on their passage to and from their continental breeding-grounds, but sometimes a straggler is observed in winter. In Ireland it is of rare occurrence, and chiefly makes its appearance in autumn, whilst in the Channel Islands it is apparently unknown. It is usually found on the coast, but examples have been known to stray inland to the neighbourhood of large sheets of water.

* Many modern ornithologists identify the *Scolopax ægocephala* of Linnæus with the Black-tailed Godwit. It is difficult to see what possible argument can be brought forward in favour of such an opinion. Linnæus was acquainted with both the European Godwits, naming the Black-tailed Godwit *Scolopax limosa*, and the Bar-tailed Godwit *Scolopax lapponica*. His *Scolopax ægocephala* is unquestionably the Bar-tailed Godwit; the description is based upon Willughby's Barge or *Ægocephalus*, and he quotes as synonyms the Godwit of Albin and of Pennant, and the *Limosa rufa major* of Brisson, all which writers unquestionably describe the Bar-tailed Godwit; and as if to make certainty more certain, the tail-feathers are described by Linnæus as "nigricantes albo-striatæ." In the face of such overwhelming evidence to the contrary, it is impossible to understand upon what principles the name was transferred to the Black-tailed Godwit.

The geographical distribution of the Black-tailed Godwit is almost an exact parallel to that of the Bar-tailed Godwit, except that the former is never found in the Arctic regions. Its reported occurrence in Greenland rests upon most unsatisfactory evidence, but it is a regular summer visitor to the south of Iceland and the Faroes. In Scandinavia it is said occasionally to breed as far north as the Arctic circle; but in West Siberia it has only been found as far north as lat. 60°, and in East Siberia it has not occurred north of lat. 55°. Like the Bar-tailed Godwit the Black-tailed Godwit may be subdivided into an eastern and a western race; but instead of the areas of distribution of the two forms being continuous in summer, and discontinuous in winter, as in the Bar-tailed Godwit, in its Black-tailed ally exactly the contrary is the case. The western form of the Black-tailed Godwit breeds in Holland, North Germany, Denmark, South Scandinavia, Central and Southern Russia, Western Turkestan, and South-western Siberia, as far east as the valley of the Irtish. So far as is known, no Black-tailed Godwit breeds in the valley of the Obb, or in that of the Yenesay, until we reach the basin of Lake Baikal, where, ranging eastwards throughout the valley of the Amoor, the eastern form of the Black-tailed Godwit breeds. The western form winters in Spain and the basin of the Mediterranean, occasionally straggling in the west as far as the Canaries and Madeira, and in the east as far as Abyssinia, Persia, India, Ceylon, and Burma. The eastern form passes through Mongolia and Japan on migration, and winters in China, the islands of the Malay archipelago, North Australia, and some of the Pacific islands.

It is not known that there is any difference whatever between the eastern and western form except that of size. The western form varies in length of wing from 9·0 to 7·9 inch, and in length of tarsus from 3·8 to 2·8 inch; whilst the eastern form varies in length of wing from 8·0 to 7·4 inch, and in length of tarsus from 2·5 to 2·4 inch—consequently the two forms must be regarded as only subspecifically distinct, and the eastern form must bear the name of *Totanus melanurus melanuroides*.

On the American continent the Black-tailed Godwit is represented by a nearly allied but perfectly distinct species, *T. hudsonicus*, which may always be distinguished from the Old-World species by having the axillaries and under wing-coverts dark brown instead of white.

The Black-tailed Godwit migrates from its winter-quarters in Africa to its breeding-grounds in large flocks, sometimes consisting of many hundred individuals. They make their appearance in the south of Spain in February, and the migration lasts until the middle of March. They pass through France in March and April, and arrive in Denmark in April and May. They are again observed passing southwards through Denmark in August and September, and through France in September

and October. The Black-tailed Godwit generally arrives on the British coasts in April and May, and passes them in its autumnal journey south in August and September. When on migration it is a shy, restless, and noisy bird, ever changing its ground, frequenting a particular locality one day and entirely deserting it the next. Sometimes days elapse and not a bird is seen; then suddenly a flock appears, stays a short time, then passes on. Although occasionally seen on the coast (generally on the mud-flats and "saltings," seldom on the sandy beach), this bird loves to frequent freshwater marshes and the swampy portions of moors. Upon the ground it walks about with head bent downward in search of food, somewhat resembling a Curlew or a Whimbrel. Sometimes it runs quickly along, and not unfrequently wades to some depth in the small pools. It is very wary, and seldom allows a near approach, often running a few feet before it takes wing. In autumn it not unfrequently congregates with other Waders, especially with Knots.

The food of the Black-tailed Godwit consists largely of worms, insects, grubs, and other soft-bodied animals, which are to be found plentifully amongst mud and soft land. Sometimes the bird may be seen searching pastures for food; whilst in autumn and winter, when it occasionally frequents the coast, it feeds on small crustaceans, sand-worms, and other small marine animals. Its diet in summer appears to be varied with roots and shoots of aquatic plants; and a number of small stones, bits of shells, and gravel are swallowed to aid in the digestion of its food.

The breeding-season of the Black-tailed Godwit commences in May, and fresh eggs may be obtained throughout that month. Although the bird is so rare in the British Islands, it breeds commonly on the opposite coasts of continental Europe, whence numbers of its eggs are annually sent to London for sale. Its breeding-grounds are in marshy districts; and although the bird can scarcely be called gregarious at this season, numbers of its nests may be found in a comparatively small area. Capt. Elwes and I took the nest of this bird in Jutland, near Tarm. On the 17th of May we devoted our time to the marshes by the river, poling down stream in a flat-bottomed boat as far as the fjord, to which I have already alluded in my article on the Avocet. In many places these marshes are of great extent. On some of the higher ground a rank grass grows, but in most places it is moss, lichen, peat, sand, and sedge, except where we sank a few inches in the water. It was rough-drained in most places, with dykes a yard or more wide, but in general we found a good bottom. The river was dammed-in with turf-banks, though it sometimes divided into several streams, and occasionally opened out into a lake full of *Equisetum limosum*. In one place the marsh was full of patches of reeds four or five feet high. The total length down to the fjord was perhaps eight miles. Ducks were frequently seen passing over this marsh-birds' paradise; and we took nests

of the Wild Duck and Shoveller, and got a nest of Garganey from a boy. The Great Snipe was only seen once or twice, but Ruffs were extremely abundant. Of neither of these birds did we obtain eggs ourselves, but old Jacob, the planter, gave us three Ruff's eggs which a boy had brought in to him. Redshanks and Dunlins were common enough, and we took several nests of the latter and one of the former with three eggs. At last we came upon several pairs of Black-tailed Godwits, whose loud cries betrayed the vicinity of their nests or young. Once or twice we heard their call-note, from which the name Godwit is derived, and which sounds like *tyü-it*; but the alarm-note—a loud, clear, rich *tyü, tyü*—was almost incessant as they hovered over our heads, with their feet projecting beyond their broad tails. As we crossed and recrossed the ground in every direction, they watched us with the greatest anxiety, sometimes flying away for a short time, but always reappearing again with renewed cries. In two places we spent at least an hour in a fruitless search for the eggs, and finally we came to the conclusion that they had young, and gave up the attempt. After spending some time in exploring the south shore of the fjord, we crossed to the north shore as a sort of forlorn hope. Here a small colony of Black-headed Gulls revived our drooping spirits, and then, by pure accident, I stumbled upon the nest of a Black-tailed Godwit. It was a mere hollow in the short coarse herbage, on the dry part of the ground, somewhat deep, and lined with a handful of dry grass. The eggs, four in number, were slightly incubated; but we did not see a trace of the parent birds. A few yards from this nest a Shoveller was sitting on nine eggs, considerably incubated.

The eggs of the Black-tailed Godwit are four in number when the full complement is deposited, olive-brown or pale olive-green in ground-colour, indistinctly blotched and spotted with darker olive-brown, and with underlying markings of greyish brown and pale inky grey. On some eggs the markings are very pale and ill-defined. They are pear-shaped, and vary in length from 2·2 to 2·05 inch, and in breadth from 1·52 to 1·45 inch. It is impossible to give any reliable points of distinction between the eggs of this Godwit and those of the Bar-tailed Godwit, which require the most careful identification. Only one brood is reared in the year. When the young are hatched the old birds become much tamer, and approach within a few feet of the intruder. It is said that they attack any predaceous bird that may chance to put in an appearance on their breeding-grounds.

Soon after the young are strong on the wing, the return migration begins; the young are the first to leave, followed by their parents. In winter this Godwit appears sooner to suffer from any protracted frost than its congener. On the meadows between Rotterdam and Leyden the Black-tailed Godwit is common, and may often be seen from the railway-train. On the outskirts of the latter town it is equally abundant, and may be seen

walking in the meadows on the banks of the rivers, frequently in grass so long as almost to conceal it. It is fond of wading, which its long legs, longer than those o the Bar-tailed Godwit, enable it to do with ease; but it does not swim or dive, except when wounded. Its flight is powerful, with outstretched neck and legs, but with the bill slightly pointing downwards.

The adult male Black-tailed Godwit in breeding-plumage, like the Bar-tailed Godwit, has the general colour of the upper parts dark brown; but the chestnut spots on the crown, mantle, scapulars, and innermost secondaries have a tendency to develop into bars and shade into chestnut on the back of the neck and sides of the head; the wings differ from those of the Bar-tailed Godwit in having a white bar across them (which is very conspicuous during flight), formed by the white tips of the longest wing-coverts and the white bases of the secondaries and innermost primaries. But the most important difference between the two species is to be found in the colour of the lower back and upper rump, which is dark brown, contrasting with the pure white lower rump and shortest upper tail-coverts, which contrast still more with the black longest upper tail-coverts and tail, the feathers of which, especially the outer ones, have concealed white bases. The underparts also present considerable differences: the chin is almost white, the chestnut is confined to the neck and breast, which gradually shades into white on the centre of the belly; the breast and flanks are barred with dark brown, but the axillaries and under wing-coverts are pure white. Bill dark brown, orange at the base; legs, feet, and claws black; irides hazel. As in the Bar-tailed Godwit, the female is much less brilliant than the male, many of the feathers, both of the upper and under parts being scarcely different from those of winter plumage. After the autumn moult the general colour of both the upper and under parts resembles that of the Bar-tailed Godwit; but the dark shaft-streaks of the feathers are absent. The wings, wing-coverts, lower back, upper tail-coverts, and tail of the Black-tailed Godwit in winter resemble those of summer, and are points which serve at all ages and in all seasons to distinguish this species from the Bar-tailed Godwit. Young in first plumage differ from adults in winter plumage in having the feathers of the head, neck, breast, and flanks suffused with buff, and those of the mantle, scapulars, and innermost secondaries broadly edged with buff. Birds of the year appear to differ from adults in winter plumage in having dark shaft-lines to the feathers of the upper parts, and dark transverse bars across many of the feathers of the underparts. Young in down are dull yellow, mottled with black on the upper parts.

Genus EREUNETES.

The genus *Ereunetes* was established in 1811 by Illiger, in his 'Prodromus Systematis Mammalium et Avium,' p. 262, to contain the Semipalmated Sandpiper, *E. pusillus*, which is the type.

It only contains four species, which are intermediate between the genera *Totanus* and *Tringa*, agreeing with the former in having the outer and middle toes united by a web at the base, and with the latter in having a soft Snipe-like bill. In their pointed wings, and tarsus scutellated both in front and at the back, and in possessing a hind toe, they do not differ from either of these genera.

Like the allied species, they have made sport for the genus-makers, who have provided each of the four species with a genus of its own. So-called structural characters have been discovered which will at least provide a key to the species, and may be admitted or rejected as of subgeneric value according to the taste of the reader.

Middle and inner toes cleft to the base. } *Macrorhamphus.*

Middle toe only about half the length of the tarsus. } *Pseudoscolopax.* } Wing not four times as long as the tarsus.
Micropalama. }
Ereunetes.

The two first-mentioned are not unlike Godwits in colour and general appearance, whilst the two latter closely resemble the Stints.

The range of the genus during the breeding-season extends from Arctic America, across Behring's Straits into Eastern Siberia. In winter it is confined to the Oriental and Neotropical Regions. One species only is an accidental visitor to Europe and the British Islands.

In their habits and mode of nidification, and in the colour of their eggs, the soft-billed, partially web-footed, Sandpipers do not differ from the species in the allied genera.

ERUNETES GRISEUS.

RED-BREASTED SNIPE.

(Plate 68.)

Scolopax grisea, *Gmel. Syst. Nat.* i. p. 658 (1788, winter plumage); **et auctorum plurimorum**—(*Bonaparte*), (*Cassin*), (*Baird, Brewer & Ridgway*), (*Salvin*), (*Sclater*), (*Coues*), &c.
Scolopax noveboracensis, *Gmel. Syst. Nat.* i. p. 658 (1788, summer plumage).
Scolopax leucophæa, *Vieill. N. Dict. d'Hist. Nat.* iii. p. 358 (1816, *nec Lath.*).
Macrorhamphus griseus (*Gmel.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 31 (1816).
Scolopax paykullii, *Nilss. Orn. Suec.* ii. p. 106 (1817).
Totanus ferrugineicollis, *Vieill. Enc. Meth.* iii. p. 1099 (1823).
Limosa scolopacea, *Say, Long's Exped.* ii. p. 170 (1823).
Totanus noveboracensis (*Gmel.*), *Sabine, Frankl. Journ.* p. 687 (1828).
Macrorhamphus punctatus, *Less. Traité d'Orn.* p. 556 (1831).
Limnodromus grisea (*Gmel.*), *Lembeye, Av. de la Isl. de Cuba,* p. 91 (1850).
Scolopax longirostris, *Bell, Ann. Lyc. New York,* v. p. 3 (1852).
Macrorhamphus scolopaceus (*Say*), *Lawr. Ann. Lyc. New York,* v. p. 4, pl. 1 (1852).
Limosa grisea (*Gmel.*), *Schl. Mus. Pays-Bas, Scolop.* p. 26 (1864).
Macrorhampus griseus, var. scolopaceus, *Coues, Check List,* no. 415*a* (1873).

The Red-breasted Snipe was first described by Pennant about 1787, from examples obtained near New York, for which he was indebted to the collection of American birds belonging to Mrs. Blackburn (hereinbefore mentioned, p. 137). In 1813 it was added to the list of British birds by Montagu, an example having been shot out of a small flock which appeared on the coast of Devonshire in October 1801 (Orn. Dict.). Since that date at least a dozen records of its occurrence in our islands appear to be well authenticated; they may be briefly summarized as follows:—One in Devonshire (Moore, Mag. Nat. Hist. 1837, p. 321); one near Carlisle, 25th of September, 1835 (Yarrell, Hist. Brit. B. iii. p. 47); one Yarmouth, October 1836 (Stevenson, 'Birds of Norfolk,' ii. p. 348); one Yarmouth, October 1840 (Gurney, Ann. & Mag. Nat. Hist. vi. p. 236); two seen, one of which was shot, at Hornsey, Norfolk, on the 9th of October 1845 (Gurney, 'Zoologist,' 1846, p. 1374); one killed some years previous to 1866 on the banks of the Thames, at Battersea (Harting, B. of Middlesex, p. 195); one previous to 1857 near Kingsbridge, Devonshire (Nicholls, 'Zoologist,' 1857, p. 5791); one St. Mary's, Scilly, on the 3rd of October 1857 (Rodd, 'Zoologist,' 1857, p. 5832); one was wounded, but afterwards escaped, near Banff, on the 25th of September, 1858 (Edwards, 'Zoologist,' 1858, p. 6269); one Dunbarnie Links, near Largo, Scotland, in September 1867 (Gray, 'B. West of Scotland,' p. 314); one on the banks of the Clyde, in Lanarkshire, killed some years previous to 1870

(Gray, 'Ibis,' 1870, p. 292); and one on the Lincolnshire coast, between Cleethorpes and Tetny Haven, on the 15th of August 1882 (Cordeaux, 'Zoologist,' 1882, p. 392). Singularly enough the Red-breasted Snipe does not appear ever to have been detected in Ireland, where it has probably occurred more often than in England. It is possible that some of the examples recorded may have belonged to the nearly allied Asiatic species.

The Red-breasted Snipe breeds throughout the Arctic regions of America from Alaska to Greenland. In autumn it migrates south; a few remain to winter in the Southern States, Mexico, the West Indies, and Central America, but the great body pass on as far as the tropical portions of South America. It is an irregular straggler on migration to the Bermudas. It has occurred more than once in France; in the Warsaw Museum there are three examples from Tchuski Land in North-east Siberia. I have seen a specimen from East Yezzo, obtained on the 13th of October, and possess a second procured in the Yokohama market on the 13th of March.

In Dauria and Mongolia the Red-breasted Snipe is represented by a nearly allied species, *Ereunetes semipalmatus*, which winters in China, Burma, and Eastern India. Blyth established the genus *Pseudoscolopax* for its reception, because it differs from its American ally in having the middle toe united to both the adjoining toes by a web at the base.

In North America the Red-breasted Snipe is a well-known bird, either in its winter-quarters or on its way to and from them in autumn and spring. It is a late bird of passage, and passes through the Northern States during May. In Alaska Mr. Adams noticed its first arrival on the 20th of that month. A few sometimes remain all the summer, either in their winter-quarters or a long way south of the breeding-grounds, probably young or barren birds. The return migration begins very early. As soon as the young are able to fly, the journey south commences, and it has been known to reach the island of Trinidad by the end of July. The migration south seems to be at its height during the months of August and September, when the United States are thronged with tens of thousands of these interesting birds, which do not appear to be in such a violent hurry to proceed as in spring, sometimes remaining in favourable districts a month or more. The Red-breasted Snipe usually migrates in flocks of from a dozen to three dozen birds, which are very tame, allowing the gunners to approach them closely, and are the last of the shore-birds to take alarm when feeding.

Although this bird somewhat resembles the Snipes, it differs considerably in its habits from those birds. It loves to frequent the extensive sands and mud-flats, running over their soft yielding surface, and probing them with its long Snipe-like bill in search of the small animals on which

it feeds. Like the Sandpipers it occasionally wades through the little pools or streamlets on the mud, and when flushed the whole flock rise simultaneously and settle again in the same manner. Its flight is very quick and powerful, but is without the erratic twistings of the Common Snipe. The bird rarely prolongs it for any distance, usually settling again in the first convenient spot. It is very fond of consorting with other Waders. Sometimes great numbers of these birds frequent the margins of freshwater ponds in the wet season, to which situations they are often lured by the whistle of the sportsman as they pass high in air overhead.

The food of the Red-breasted Snipe is composed almost exclusively of worms and insects, for which it probes with its long beak in the mud. Specimens of this bird obtained by Richardson had their crops filled with leeches and the remains of beetles. It is also said to eat small seeds, and may possibly devour some of the small ground-fruits which grow so profusely in the Arctic regions. The note of this bird is described as a peculiar whistle, easily imitated by sportsmen; and Dr. Coues says that its alarm-note is a soft *weet*, uttered just before taking wing. He also states that, when wading, if it should chance to get out of its depth, it swims without difficulty, sitting very lightly on the water, and accompanying the motion of its feet by a bobbing action of the head.

The breeding-grounds of the Red-breasted Snipe are in the marshes of the Arctic regions, even those close to the sea. The eggs and nest of this bird were practically unknown until MacFarlane discovered them in the neighbourhood of Fort Anderson. The nests he obtained were taken between the 21st of June and the 1st of July, and were built amongst the vegetation on the marshy borders of small lakes. They were very slight—a mere depression in the mossy ground into which a few dead leaves were scraped as a lining. From one of the nests the female was disturbed, when she flew some height into the air with a shrill long-continued note of alarm, and after a few minutes was seen to return in a perpendicular direction to her charge. Mr. Dall obtained the eggs of this bird in Alaska. He found a nest on the 3rd of June, which was merely a little hollow in the ground in a grass hummock in a marshy place, with scarcely any lining. On the 6th of June he took the eggs and captured the parent, which, when flushed from her eggs, scurried off very quickly, and was very difficult to shoot as she dashed amongst the hummocks of grass.

The eggs of the Red-breasted Snipe are four in number, and vary in ground-colour from pale buffish brown to pale greenish brown, spotted and blotched with dark reddish brown, and with well-marked pale greyish-brown underlying spots. Most of the blotches and spots are on the large end of the egg, many of them being confluent. A few streaks of very dark blackish brown are sometimes seen over the ordinary blotches, and the latter occasionally take an oblique direction. They are pyriform in

shape, and vary in length from 1·75 to 1·55 inch, and in breadth from 1·2 to 1·08 inch. There appear to be no reliable characters by which the eggs of the Red-breasted Snipe may be safely distinguished from those of either the Common Snipe or Wilson's Snipe. Only one brood appears to be reared in the year. Of the habits of the young and their parents during the breeding-season nothing appears to be known.

The adult male and female Red-breasted Snipe in breeding-plumage have the head, neck, mantle, scapulars, and adjoining innermost secondaries dull blackish, streaked with chestnut-buff, the latter colour soon fading during the summer, and almost entirely disappearing by abrasion before the autumn moult. The quills, wing-coverts, and adjoining innermost secondaries are brown, margined and mottled with white on the secondaries; the lower back is white, spotted with blackish brown on the rump; the upper tail-coverts and tail-feathers are white, barred with blackish brown. The ground-colour of the underparts is buffish chestnut, shading into nearly white on the centre of the belly, spotted on the neck and breast, and barred on the flanks and under tail-coverts with blackish brown; the axillaries and under wing-coverts are white, barred with dark brown. Bill dark brown; legs and feet olive-brown, claws black; irides hazel. After the autumn moult the colours of the wings, wing-coverts, upper back, rump, upper tail-coverts and tail, axillaries, and under wing-coverts are not changed; but the rest of the plumage of the upper parts is greyish brown, each feather darkest in the centre and palest on the margin; on the underparts the chestnut-buff is replaced by pale greyish brown; the spots on the neck and breast have disappeared, and the bars on the flanks and under tail-coverts are less distinct. Young in first plumage resemble adults in breeding-plumage, but the brown of the upper parts is paler, the chestnut-buff is more conspicuous and extends to the wing-coverts and all the innermost secondaries; the ground-colour of the underparts is paler, and the spots and bars are not more conspicuous than they are in winter. Birds of the year resemble adults in winter plumage, but retain the wing-coverts of young in first plumage.

There appear to be two fairly well-defined geographical races of the Red-breasted Snipe, an eastern and a western one, presenting differences both of colour and size. *Ereunetes griseus* is found on the Atlantic coasts of North America, varying in length of wing from 5·25 to 5·9 inch, and in length of bill from 2·0 to 2·55 inch, with the centre of the belly white; whilst *E. griseus scolopaceus* inhabits the Pacific coast from Mexico to Alaska, and varies in length of wing from 5·4 to 6·0 inch, and in length of bill from 2·1 to 3 inch, with the underparts uniform buffish chestnut.

Genus TRINGA.

The genus *Tringa* was recognized by Linnæus in 1766, in the twelfth edition of his 'Systema Naturæ,' i. p. 247. It is impossible to discover any type of the genus *Tringa*, inasmuch as the *Tringa tringa* of Brisson (the Green Sandpiper) and the species mentioned first both by Linnæus and Bechstein (the Ruff) both belong to the genus *Totanus*. It is therefore necessary to rely upon the verdict *auctorum plurimorum*, which falls, so far as I have been able to ascertain, upon the Knot, *T. canutus*, which may be accepted as the type.

The soft-billed, cleft-toed Sandpipers have the tarsus scutellated before and behind (a character which serves to distinguish them from the Curlews), and they are all furnished with a hind toe. In all the species the toes are cleft to the base. The bill is always shorter than the combined lengths of the tarsus and middle toe, and never as much as a fourth of the length of the wing; it is narrow and very slightly compressed before the end, which is covered by a soft membrane like that of a Snipe. The tail-feathers are always plain, without any bars or other darker markings.

The species of the genus *Tringa* are (with one doubtful exception) confined to the Palæarctic and Nearctic Regions during the breeding-season, but in winter this genus is almost cosmopolitan. It contains about a score species, half of which are included in the European list, visiting our islands principally on migration.

The birds in this genus inhabit both the sea-coast and inland marshes, streams, and moorlands. In most of their habits they do not differ from the birds in the preceding genera; their flight is equally powerful, they run and walk with equal ease, their notes are similar, as are also their food and manner of reproduction.

The soft-billed, cleft-toed Sandpipers have been subdivided by modern ornithologists into six or more genera; but the characters upon which they are founded are so trivial that they are not worth enumeration. The following key to the British species will enable the ornithologist to name a bird in any plumage :—

a. Upper tail-coverts white, or white barred with black.
  *a*¹. Length of wing more than 6 inches ..... T. CANUTUS.
  *b*¹. Length of wing less than 5¼ inches ..... T. SUBARQUATA.
b. Upper tail-coverts white, streaked with black ..... T. BONAPARTI.

c. Upper tail-coverts nearly uniform brown.
  c^1. Secondaries with white bases, some almost entirely white.
    a^2. Small black feet: middle toe and claw about ·85 inch.. T. ALPINA.
    b^2. Large pale feet: middle toe and claw about 1 inch .. T. MARITIMA.
  d^1. Secondaries nearly uniform brown.
    c^2. Wing over $4\frac{1}{2}$ inches long.
      a^3. Large pale feet: middle toe and claw about 1·2 inch ..... T. PECTORALIS.
      b^3. Small black feet: middle toe and claw about ·9 inch ..... T. PLATYRHYNCHA.
    d^2. Wing under 4 inches long.
      c^3. Outer tail-feathers white ..... T. TEMMINCKI.
      d^3. Outer tail-feathers brown.
        a^4. Small black feet: middle toe and claw about ·75 inch ..... T. MINUTA.
        b^4. Large pale feet: middle toe and claw about ·85 inch ..... T. MINUTILLA.

TRINGA CANUTUS.

KNOT.

Tringa calidris,
Tringa calidris nævia,
Tringa calidris grisea,
} *Briss. Orn.* v. pp. 226, 230, 233 (1760).

Tringa canutus, *Briss. Orn.* v. p. 258 (1760); *Linn. Syst. Nat.* i. p. 251 (1766, winter plumage); **et auctorum plurimorum**—*Schlegel, Gray, Hartlaub, Heuglin, Dresser, Saunders*, &c.

Tringa calidris, *Linn. Syst. Nat.* i. p. 252 (1766, immature plumage).

Tringa islandica, *Linn. Syst. Nat.* i. pt. ii. *Addenda* (1767, summer plumage).

Tringa australis,
Tringa nævia,
Tringa grisea,
} *Gmel. Syst. Nat.* i. pp. 679, 681 (1788).

Tringa ferruginea, *Meyer, Taschenb.* ii. p. 395 (1810).

Tringa rufa, *Wils. Amer. Orn.* vii. p. 43, pl. 57. fig. 5 (1813).

Calidris islandica (*Linn.*), *Ross, Voy. of Discovery*, ed. 2, ii. App. iv. p. 167 (1819).

Canutus islandicus (*Linn.*), *Brehm, Vög. Deutschl.* p. 654 (1831).

Calidris canutus (*Linn.*), *Gould, B. Eur.* iv. pl. 324 (1837).

Tringa lomatina, *Licht. Nomencl. Av.* p. 92 (1854).

Tringa cooperi, *Baird, Cass. & Lawr. B. N. Amer.* p. 716 (1858).

Actodromas cooperi (*Baird*), *Ridgw. Nom. N. Amer. B.* p. 44 (1881).

The Knot is a winter visitor to the British Islands, and frequents the coasts, principally on the east and south of England. In Scotland it is much less common on the west coast than on the east. Most of the birds retire from the northern portion of our islands in winter, especially in severe seasons. In Ireland the Knot is equally well known as a winter visitor. Although so common on the neighbouring coast, the Knot is scarce in the Channel Islands.

Scarcely any thing is known of the breeding-places of the Knot, and authenticated eggs are entirely unknown in collections. So far as I know, the only man now living who has ever seen an egg of the Knot is Lieut. Greeley, who took one, fully coloured, from the body of a female Knot during his adventurous expedition to the Polar Regions. He told me that it was a very handsome egg, very boldly blotched, and about as large as that of the Common Snipe. In 1820 Sabine found it breeding in great abundance on Melville Island, about lat. 80°; in 1823 it was observed breeding on Melville Peninsula, about lat. 67°; Richardson (Faun. Bor.-Amer. ii. p. 387) says that it also breeds in Hudson's Bay, as far south as lat. 55°; and on the 9th of July, 1853, a female example was obtained at Cambridge Bay, in lat. 69°, by the surgeon of the 'Enterprise;' but it is not known that any eggs obtained on these expeditions are in any collection. In 1876 Capt. Feilden, the naturalist

on board the 'Alert,' obtained young in down, as well as their parents, on Grinnell Land, in lat. 82½°; and Mr. Hart, the naturalist of the 'Discovery,' on the same coast, in lat. 81¾°, also secured young in down; but neither of these naturalists procured any eggs. It has also been obtained in Alaska and Greenland. It passes through Iceland on migration, but is not known to breed there. In the Arctic regions of the Old World our information is still more meagre. Hencke observed it in the delta of the Dwina in summer, but failed to obtain eggs. It has been observed on migration in the valleys of the Kama and the Obb; but Harvie-Brown and I saw nothing of it in the delta of the Petchora. It is not recorded from either Spitzbergen or Nova Zembla; Finsch failed to observe it on the Yalmal peninsula; nor was I any more fortunate in the delta of the Yenesay. Middendorff saw nothing of it on the Taimur peninsula, except that he picked up a dead bird in autumn, and shot two birds on the 27th of May. Dybowsky only obtained one example, near Lake Baikal, which had been shot on the 24th of August. Middendorff saw flocks of this bird on the 7th of July at the mouth of the Uda, in the Sea of Ochotsk (about lat. 55°); and Schrenck obtained two examples on the 29th of August at the mouth of the Amoor, a few miles to the east of the latter locality.

The Knot is very rare in the Mediterranean during winter, but in spring and autumn it passes in considerable numbers to and from its winter-quarters on the west coast of Africa, where it occurs as far south as Damara Land. North of the French coast the stream of migration divides, one route taking the west coast of England and Scotland through the Faroes to Iceland and Greenland, but the main route following the Dutch and German coasts through Heligoland or the east coast of Great Britain, through the Orkneys and the Shetlands, to the North Cape. It has only occurred once or twice in India, and not at all in Ceylon or Burma; but on the west coast of the Pacific it passes Japan and China on migration, to winter in Australia and New Zealand. It does not appear to be recorded from the Pacific coast of America; but it passes in considerable numbers on migration along the Atlantic coast of that continent, as well as along some of the well-known inland fly-lines, and has been obtained in winter as far south as Brazil.

The nearest ally of the Knot appears to be *Tringa crassirostris*, which breeds in Eastern Siberia and winters in Australia, occasionally straying westwards to Burma. It may always be readily distinguished by its somewhat larger size, in winter by its white upper tail-coverts, and in summer by having the breast and flanks barred with black and the chestnut confined to a few feathers on the upper parts.

The Knot reaches the British coast in small numbers in August, and continues to arrive through the two succeeding months. The date varies somewhat according to the state of the season; but the young birds are

always the first to make their appearance, being followed some time afterwards by their parents. Odd birds have been noticed at different times throughout the summer; so that it is very possible that a few non-breeding birds may remain in their winter-quarters instead of going north with their companions. They stay on our coasts until the middle of the following May, when the great bulk pass on again to the north. No portion of the British coast is so favoured with Knots as the low-lying shores between the Humber and the Wash. In this endless paradise of wading birds Knots may be seen in countless thousands, and next to the Dunlin it is the commonest bird. Their favourite haunts are the wide, almost interminable mud-flats left by the receding tide, the low-lying shores of the Humber, and the open expanse of the Wash, with its thousands of acres of salt-marsh, mud-flats, and sand. The flight-nets unerringly proclaim the date when the great flocks arrive, and hundreds are often taken in a single night, as they sweep along the coast just above the surface of the sea which ripples at high water over the extensive mud-flats. Just after their arrival they are remarkably tame; but incessant persecution soon teaches them the lesson of wariness, which the Arctic solitudes had failed to do. The Knot appears sometimes to migrate across country; and Swaysland once caught six in a bird-net, all flying north-east, at the Devil's Dyke, near Brighton.

It is an animating sight to watch a flock of these little Arctic strangers feeding on the mud-flats or sands. Perhaps the romance attaching to their breeding-grounds and still all but undiscovered eggs adds to the charm, and increases the interest in these birds. When feeding they usually keep well together, all pointing their heads in one direction, systematically searching the ground for food. The smaller birds which are scattered amongst them, and trip here and there up and down the sands, crossing and recrossing each other's tracks, are Dunlins; the Knots do not rush about in such an erratic manner. The legs are bent and the head is thrust well forward as the Knot seeks for its food. They often search quite close to the receding waves, following in their wake to pick up the various small animals cast ashore. Sometimes a solitary bird may be seen feeding, running to and fro, picking here and there, or standing preening its plumage. Large flocks often congregate on some favourite mud-bank and remain almost motionless for hours. If alarmed, the whole flock rises *en masse*, and on rapid wing scurries along just above the sands to quieter and safer quarters. Sometimes they wheel and turn, or fly for a little distance out to sea, and perform various graceful evolutions ere alighting. The Knot is capable of running with great speed, especially when wounded in the wings. When a very large flock is congregated, many of the birds are ever on the wing, flying over the heads of their companions to find a more suitable feeding-place and then settling again. The Knot feeds by

night as well as by day, and the flocks of these birds seem as active by moonlight as during daylight. They often become very restless towards evening, and it is no uncommon thing to see them passing along over the mud-flats or the sea at sunset on their way to a favourite feeding-place.

The food of the Knot consists of small sand-worms, aquatic insects, crustaceans, and small mollusks. Wilson observed that on the sandy shores of New Jersey this bird fed almost exclusively on a small bivalve shell-fish of a pearly-white colour, which was swallowed whole. Its food in summer is probably almost exclusively composed of insects and larvæ, varied occasionally with buds and perhaps ground-fruit. Mr. Cordeaux states that he has frequently found its gizzard crammed with entire shells and broken pieces of marine bivalves, principally belonging to the genus *Tellina*. In autumn these birds are very fat and their flesh is prized as an article of food, numbers being netted and shot for the markets.

The breeding-habits of the Knot are not very well known, and, perhaps, the best particulars of this interesting period of its existence are those collected by the naturalists of the 'Alert' and 'Discovery' during the last British Arctic Expedition. Captain Feilden says that when camped, in 1876, near Knot Harbour, in Grinnell Land, Knots were first seen on the 5th of June: a flock of fourteen flew over a hill-side, and alighted to feed on the buds of the well-known *Saxifraga oppositifolia*. They were afterwards met with in considerable numbers, but were always wild and difficult to approach. Feilden describes the note of the Knot as wild, something like the cry of a Curlew. Immediately after their arrival in June they began to pair, and two males were sometimes observed following a single female. During the pairing-time they soared in the air like a Snipe, and, in descending from a height, beat their wings together behind their backs, making a loud whirring noise. During July Feilden and his companions tried hard to discover the nest of the Knot, but without success. On the 30th of that month, the day before they left their winter-quarters, three of the sailors, walking near a small lake, had the good fortune to come upon an old male with three downy nestlings.

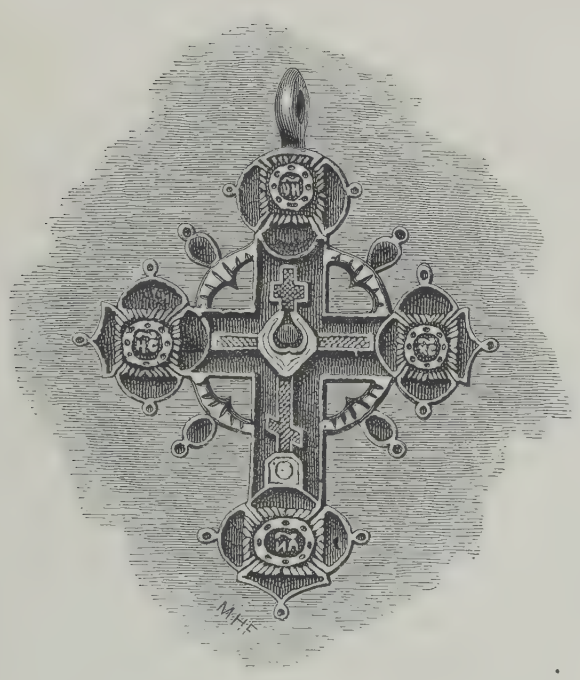
Mr. Hart, the naturalist attached to the 'Discovery,' observed the first Knots on the 31st of May, after which date they became common. He also describes them as very wary, and as often feeding at a considerable distance inland, on the margins of the lonely swamps and pools. One pair of Knots, after having evidently selected a nesting-site, deserted it when they found that they were being watched. Mr. Hart says that, when pairing, the birds toy with each other in the air and on the ground, the male occasionally uttering a sweet flute-like whistle. On the 11th and 12th of July, when the young were just hatched, the parents tried by various manœuvres to decoy him away; they ran along the ground with outspread wings, or took short flights and suddenly alighted again close to

his feet. Although a diligent search was made and a liberal reward offered, no eggs of the Knot were found. The nest was on the ground under a large flat stone, which was resting on two others, and was composed of a few leaves and bits of dry grass loosely put together. Two nests were found several miles inland, in each case close to a stream. It is in the highest degree improbable that the Knot lays more than four eggs; but Dr. Coppinger once met with a brood of five young ones. Capt. Lyons, of the 'Hecla,' on Parry's second voyage, says that the Knot deposits its four eggs on a tuft of dry grass; and Richardson, on the authority of Mr. Hutchins*, describes the eggs as "of a dun colour, fully marked with reddish spots." These are all the particulars known of the breeding-habits of this interesting bird; and its eggs still form the prize with which some adventurous ornithologist will eventually be rewarded.

It is not known that there is any difference in the colour of the sexes of this species. The breeding-plumage of the adult Knot is very handsome, nearly the whole of the underparts being rich chestnut, mixed with white on the centre of the belly and under tail-coverts; the axillaries, flanks, and longest under tail-coverts are white, barred with dark brown, and the under wing-coverts are white, mottled with dark brown. The rich chestnut extends to the sides of the head and neck and over the eye, and is very conspicuous on the crown, mantle, scapulars, and innermost secondaries, but is almost obsolete on the rump and upper tail-coverts, where it is replaced by white, all these feathers of the upper parts being more or less streaked and barred with black. The tail is uniform grey; the wing-coverts are brownish grey, with paler margins, as in winter, and with an occasional feather here and there coloured like the back. The quills are brown, with pale edges to the secondaries. Bill, legs, feet, and claws nearly black; irides hazel. After the autumn moult all trace of chestnut has disappeared from the plumage, the upper parts are an almost uniform greyish brown, paler on the margins of the wing-coverts, but the black bars are retained on the rump and upper tail-coverts; the underparts are pure white, streaked with greyish brown on the neck and under tail-coverts, and barred with the same colour on the breast, flanks, axillaries, and under wing-coverts. Young in first plumage resemble adults in winter plumage in the colour of the rump and upper tail-coverts, but differ from them in having most of the feathers of the upper parts with a pale buff margin, which is emphasized by a narrow submarginal dark brown band; the underparts scarcely differ from those of the adult in winter, except that they are suffused with buff, which, as well as the buff on the upper parts, changes to pure white in the course of the autumn. The legs and feet are dark olive.

* Hutchins was a surgeon, many years resident in Hudson's Bay, who communicated to Pennant "his MS. observations in a large folio volume, in every page of which his extensive knowledge appears" (Pennant, 'Arctic Zoology,' ed. 2, i. p. 233).

Birds of the year scarcely differ from adults in winter, except that they retain the wing-coverts of their first plumage, with their black and white margins. After the first spring moult the chestnut below the breast and the greater portion of that on the upper parts is very imperfectly assumed (so that when the white margins of the feathers abrade during the summer, the back becomes very dark in colour) and the dark bars on the breast and flanks are reproduced. It is doubtful whether birds in this plumage ever breed. Young in down are greyish buff, mottled on the upper parts with black and rufous.



TRINGA SUBARQUATA.

CURLEW SANDPIPER.

Scolopax subarquata, *Güld. Nov. Comm. Petrop.* xix. p. 471, pl. xvii. (1775); **et auctorum plurimorum**—(*Blasius*), (*Naumann*), (*Schlegel*), (*Temminck*), (*Gould*), (*Dresser*), (*Saunders*), &c.
Numenius pygmæus, *Lath. Gen. Syn. Suppl.* i. p. 291 (1787).
Scolopax africana, Scolopax pygmæa (*Lath.*), *Gmel. Syst. Nat.* i. p. 655 (1788).
Numenius africanus (*Gmel.*), *Lath. Ind. Orn.* ii. p. 712 (1790).
Scolopax dethardingii, *Siemss. Handb. Mecklenb. Land- u. Wasservögel*, p. 169 (1794).
Numenius subarquata (*Güld.*), *Bechst. Orn. Taschenb.* ii. p. 276 (1803).
Numenius ferrugineus, *Meyer, Taschenb.* ii. p. 356 (1810).
Tringa subarquata (*Güld.*), *Temm. Man. d'Orn.* p. 393 (1815).
Tringa pygmæa (*Lath.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 30 (1816).
Erolia variegata, *Vieill. Analyse*, p. 55 (1816).
Falcinellus pygmæus (*Lath.*), *Cuv. Règn. An.* i. p. 486 (1817).
Trynga falcinella, *Pall. Zoogr. Rosso-Asiat.* ii. p. 188 (1826).
Ancylocheilus subarquatus (*Güld.*), *Kaup, Natürl. Syst.* p. 50 (1829).
Pelidna subarquata (*Güld.*), *Brehm, Vög. Deutschl.* p. 657 (1831).
Tringa (Pelidna) chinensis, *Gray, Zool. Miscell.* p. 2 (1831).
Ærolia varia, *Vieill. Gal. des Ois.* ii. p. 89 (1834).
Falcinellus cuvieri, *Bonap. Comp. List B. Eur. & N. Amer.* p. 50 (1838).
Schæniclus subarquatus (*Güld.*), *Gray, List Birds Brit. Mus.* iii. p. 105 (1844).
Tringa subarcuata (*Güld.*), *Finsch & Hartl. Vög. Ost-Afr.* p. 761 (1870).

It is rather remarkable that the Curlew Sandpiper escaped the attention of both Linnæus and Brisson. It appears to have been first discovered about 1772, when it was described and figured by Pennant ('Genera of Birds,' p. 65, pl. xi.) from an example sent to him from Holland by Dr. Gronovius. It was first recorded as a British bird by Latham, who obtained an example in 1786, which was shot near Sandwich, in Kent.

The Curlew Sandpiper is probably often mistaken for the Dunlin, and consequently looked upon as a rarer bird than it really is. It is not an uncommon bird on migration in the British Islands, occurring on many parts of the coast, but being most numerous on those shores where extensive mud-flats are exposed at low water. It is more numerous on the east coasts, both of Scotland and England, than on the west, and is much more common in autumn than in spring. It is a regular autumn visitor to Ireland, and a few probably winter on the south coast. It is only known as a rare visitor to the Channel Islands. The statement made by Gray, that this species had bred in a sedgy bog on the Loch of Spynie, near Elgin, and that its nest was discovered on the 8th of June, 1853, containing four

eggs, is utterly worthless without the evidence of the capture of the parent birds, which, no doubt, were Dunlins.

The Curlew Sandpiper is supposed to breed in the Arctic regions of Europe and Asia, from Lapland to Behring's Straits, though authentic eggs have never been obtained *. It is doubtfully recorded from Iceland and Greenland; but inasmuch as it occurs as an accidental straggler on the Atlantic coast of North America, it is most probable that these records are true. Both Henke and Harvie-Brown obtained it in summer at Archangel; I found it both in the valleys of the Petchora and the Yenesay. Middendorff obtained it on the Taimur peninsula; and it was observed by the 'Vega' Expedition near Behring's Straits. On migration it passes along the European coasts, the great inland lines of migration, and along the coasts of China, but it has not been recorded from Kamtschatka or Japan. A few remain to winter in the basin of the Mediterranean, but the majority pass on to Africa, throughout which continent they are found in suitable localities. It also winters on the Mekran coast, in India, Ceylon, the Andaman Islands, Burma, the islands of the Malay archipelago, and Australia. The Curlew Sandpiper appears to have no ally nearer than the Knot †.

Towards the end of April vast numbers of Curlew Sandpipers pass Gibraltar on their way north to their still unknown breeding-places. These little travellers journey in small parties of from ten to twenty individuals, sometimes consorting with Dunlins and Knots. In the east of Europe the migration begins about the same time as in the west, and lasts as long, generally extending to the end of May. Curlew Sandpipers appear on the British coasts in April, but the greater part do not arrive until May, and are even seen as late as the beginning of June. They spend a short northern summer on the Arctic tundras, and reappear, much commoner than in spring, for the most part young birds, on the British coast in August and September, remaining until October.

* The statement made in 'The Ibis' by Dr. Finsch, that he obtained the young in down of the Curlew Sandpiper on the Yalmal peninsula was contradicted in the book which he afterwards published, the *Tringa subarquata* of the former being altered to *Tringa alpina* in the latter. The statement of Mr. Kumlien (quoted by Messrs. Baird, Brewer, and Ridgway), that he obtained eggs of the Curlew Sandpiper from North Greenland, proves to be equally unfortunate, as Mr. Ridgway informs me that the eggs procured by Governor Fencker were those of the Purple Sandpiper.

† In consequence of the decurved bill, this species has been placed by many ornithologists in a different genus to that which contains the Knot. Baird, Brewer, and Ridgway associate it with the Dunlin under the genus *Pelidna*; but few persons who will take the trouble to compare the somewhat complicated changes of plumage which the Curlew Sandpiper and the Knot undergo, and contrast these with the entirely different changes through which the Dunlin passes, will avoid coming to the conclusion that in this case, at least, the colours of the plumage are of much greater generic value than the shape of the bill.

During its sojourn in our islands its haunts are on the sea-shore, in precisely similar situations to those chosen by the Dunlin. It is also often met with on the margin of pools near the sea, as well as on the marshes at some distance from the beach. It delights to frequent broad and open stretches of mud and sand, the extensive salt-marshes, and the mouths of large rivers. In many of its habits it closely resembles the Dunlin. It is an active lively little bird, by no means shy, and very fond of associating with other small Waders. Mr. Adamson noticed that a few Curlew Sandpipers that frequented Holy Island for some time appeared to prefer to feed further from the sea than the Dunlins, and haunted the higher sands which were overgrown with reeds. Upon the shore it runs actively to and fro with head bent almost to the ground, in eager search for the small animals on which it lives. Its flight is very similar to that of the Dunlin, and usually taken quite close to the sand, or just over the surface of the water. Sometimes it flies much higher; and not unfrequently, when a large flock is disturbed, the birds wheel and poise and manœuvre in the air, their dark backs and light breasts making a pleasing effect as those parts are alternately turned to the observer.

The food of the Curlew Sandpiper consists of small worms, crustaceans, insects, and both salt- and fresh-water mollusks. It also appears to eat tender roots of marsh-plants, and in summer its fare is probably varied with small ground-fruits. Its stomach often contains a little gravel, or a few bits of broken shells, to aid in digestion. The note of this bird resembles, according to Legge, that of the Little Stint, but is louder. The Curlew Sandpiper obtains much of its food at night, especially if there be a moon. It is always a late bird to retire, and one of the first to make its appearance on the shore at dawn. Saxby says that in Shetland, at high water, these birds resorted to the stubble-fields near the sea to rest until the water had subsided again. In such a novel situation for a bird of this kind they seemed very tame, or trusted to the security which the protective colours of their plumage insured, sometimes allowing him to walk amongst them ere they took wing.

The habits of the Curlew Sandpiper during the most interesting period of its existence are absolutely unknown. It seems that many birds pair before they quit their winter-quarters; for Legge noticed two Curlew Sandpipers isolated a short distance from a flock of their companions, bowing to each other and going through various other mysteries of courtship. The breeding-grounds of this bird are most probably on the wild lonely tundras that stretch for miles and miles along the shores of the Arctic Ocean, from North Russia eastwards to the Pacific. Even during the breeding-season this little Sandpiper appears to be sociable. I shot one in the valley of the Petchora in the middle of July; but as it was in the plumage of a bird of the year after its first spring moult, it was pro-

bably not breeding. I was eagerly searching for the breeding-grounds of the Little Stint, and was wandering amongst sand-hills sprinkled over with esparto grass, and ground covered with thick short grass, studded with little pools. The little flock of Sandpipers were feeding on the edge of a small island in the lagoon, and I shot one of them, which turned out to be a veritable Curlew Sandpiper. Middendorff must by the merest of chances have missed obtaining the eggs of this interesting bird, for he shot a female with an almost fully developed egg in the ovary. Like the eggs of the Knot, those of the Curlew Sandpiper are still a prize which some adventurous ornithologist has yet to secure.

The Curlew Sandpiper is a miniature Knot with a long decurved bill. The adult in breeding-plumage only differs from that of the Knot in having the chestnut of both the upper and under parts darker and richer, and in having the axillaries pure white. Bill, legs, feet, and claws black; irides hazel. After the autumn moult the plumage differs in no appreciable degree from that of the Knot at that season, except that the bars disappear from the upper tail-coverts, the axillaries remain white, and the marks on the underparts are confined to a few striations on the sides of the neck and the breast. Young in first plumage have the ground-colour of the upper parts much darker than in the Knot, causing the sub-marginal dark bands on the feathers to be much less distinct; and, as in winter plumage, the pure white axillaries and upper tail-coverts distinguish the Curlew Sandpiper. Birds of the year differ from adults in winter plumage in having the pale margins of the wing-coverts, scapulars, and innermost secondaries more distinct. After the first spring moult the Curlew Sandpiper differs from the similar plumage of the Knot in having the dark bars on the underparts more developed, nearly every feather having a white margin, emphasized by a narrow dark brown sub-marginal band. The chestnut on the upper parts is much more brilliant than in the similar stage of plumage of the Knot. Birds in this plumage do not breed, as they may be found on our coasts throughout the summer, generally in small flocks. I have three examples in my collection, shot on the Sussex coast on the 19th of July. Young in down are absolutely unknown.

In winter plumage the Curlew Sandpiper bears a superficial resemblance to the Sanderling and the Dunlin, but may at a glance be distinguished from either of these species by its white upper tail-coverts.

TRINGA ALPINA.

DUNLIN.

(Plate 31.)

Tringa cinclus,
Tringa cinclus torquatus,
Scolopax gallinago anglicana, } *Briss. Orn.* v. pp. 211, 216, 309 (1760).
Tringa alpina, *Linn. Syst. Nat.* i. p. 249 (1766, summer plumage); **et auctorum plurimorum**—*Vieillot, Wilson, Swainson, Audubon, Pennant, Montagu, Bewick, Fleming, Dresser, Baird, Brewer & Ridgway, Saunders*, &c.
Tringa cinclus, *Linn. Syst. Nat.* i. p. 251 (1766, winter plumage).
Scolopax pusilla, *Gmel. Syst. Nat.* i. p. 663 (1788).
Numenius variabilis, *Bechst. Naturg. Deutschl.* iii. p. 141 (1809).
Tringa variabilis (*Bechst.*), *Meyer, Taschenb.* ii. p. 397 (1810).
Pelidna cinclus (*Briss.*), *Cuv. Règ. An.* i. p. 490 (1817).
Tringa schinzii, *Brehm, Beitr. Vögelk.* iii. p. 355 (1822).
Pelidna variabilis (*Bechst.*), *Steph. Shaw's Gen. Zool.* xii. pt. i. p. 98 (1824).
Scolopax alpina (*Linn.*), *Pall. Zoogr. Rosso-Asiat.* ii. p. 176 (1826).
Tringa cinclus minor, *Schleg. Rev. Crit.* p. 89 (1844).
Schæniclus cinclus (*Briss.*), *Gray, List Birds Brit. Mus.* iii. p. 104 (1844).
Tringa alpina, *var.* americana, *Baird, Cassin, & Lawr. B. N. Amer.* p. 719 (1858).
Pelidna pacifica, *Coues, Proc. Phil. Acad.* 1861, p. 189.
Tringa cinclus, *var.* chinensis, *Gray, apud Swinhoe, Proc. Zool. Soc.* 1871, p. 408.
Pelidna alpina americana (*Cass.*), *Ridgw. Proc. U.S. Nat. Mus.* 1881, p. 200.

The Dunlin is the commonest of all the Sandpipers on the coasts of the British Islands during spring and autumn migration. It is, however, so frequently met with during winter, and also breeds in such numbers in various parts of the country, that it may fairly claim to be regarded as a resident. The Dunlin is a regular summer visitor to the west of Scotland and the adjacent islands, including the Outer Hebrides, the Orkneys, and the Shetlands. It winters in great numbers on the coasts of Ireland, where a few remain to breed on the mountains and bogs. In England it is a very rare and local bird during the breeding-season. Hancock says that it used to breed regularly on Prestwick Car, near Newcastle, before it was drained, and its nest is still occasionally found on the Northumberland moors. It still breeds in "the Lakes" and on some of the surrounding moors. The marshes of the Dee in Cheshire still claim to be breeding-places of the Dunlin; and there can be little doubt that it ought to be found on many of the Welsh mountains, as it has been known to breed on the moors which form the water-parting of Cornwall. It is not known to breed in any other part of England, but there is some evidence that it may do so in the Lincolnshire fens.

The Dunlin is a circumpolar bird, breeding throughout the Arctic regions

of both continents—in Asia up to lat. 74°, but in America probably not so far north. It breeds in Greenland, on Iceland, and the Faroes, and in suitable localities throughout Scandinavia, Denmark, Finland, and the Baltic Provinces. An isolated instance is on record of its having bred in Spain; and I have an egg in my collection out of a clutch of four from which the bird was shot by Mr. Abel Chapman in the marshes of the Guadalquivir. It winters in the basin of the Mediterranean, in Spain and Portugal, and in North Africa—on the west coast it has not been found further south than the Canaries, but on the east coast it crosses the line to Zanzibar. On migration it passes along the valleys of the Kama and the Volga, and through Turkestan, to winter on the southern shores of the Caspian and the Mekran coast. I did not meet with it in the valley of the Yenesay until lat. 69°; Dybowski did not obtain it near Lake Baikal, neither has it occurred in the valley of the Amoor except near the coast. It passes on migration along the east coast of Siberia, visiting Japan and North China, and winters in South China, Formosa, Borneo, and Java. It has not occurred in Burma, and is only a rare visitor to the coasts of North India. On the American continent it migrates along both coasts, and winters in the Southern States and in the West Indies.

The Dunlin is probably the most numerous of all the Sandpipers and the most gregarious. Enormous flocks of these birds frequent the coast during winter; and even at its breeding-grounds it is constantly seen in flocks. The latter may be composed partly of birds of the previous year which are not breeding, and partly of males, the duties of incubation being carried on by their patient females, who only join them at low tide to feed. Neither in summer nor in winter are the flocks always large, but may consist of any number of birds from a few individuals to a few thousands. As a rule, the larger the flock is the more wary are the birds. They are also fond of associating with other Sandpipers, especially on migration. It is almost exclusively a shore-bird, and "hugs the coast" even on migration, though a few small parties are occasionally seen on the inland lines of flight. It occasionally visits the sandy shores of the ocean, but its favourite resorts are the mud-banks which are principally found at low water in the estuaries of rivers. In such situations it may be seen tripping daintily on the slimy surface in small and large parties, eagerly searching for the little worms and other marine insects on which it feeds, wading into the little pools, and sometimes even venturing to allow itself to be overtaken by the miniature wavelets that run along the sandy mud, as the spent pulses of the tide ebb and flow on the shore. When alarmed the flock rises instantaneously, as if obeying the command of one leader, and flies off in perfect order, seldom leaving a straggler behind; at a very short distance the birds are invisible against the similarly coloured ground, but ever and anon the observer may see the flash of a hundred wings, reflecting

at the same moment the sun's rays, as the flock wheels round in its course. At one time the birds may be seen to "bunch," like a flock of Starlings, and at others they expand into a sheet preparatory to settling down again to feed. Occasionally a solitary bird is to be seen, standing quietly under the lee of a low bank, close to the water's edge. These are generally birds of the year, and usually allow of a near approach without showing signs of alarm. Like most of the Sandpipers, the Dunlin is a bird of very rapid flight, darting along with bent wings, which appear almost closed as the bird shoots diagonally like an arrow to the ground.

The Dunlin is by no means a noisy bird. Its ordinary alarm-note is not very loud nor very musical, and may be described as a grating sound resembling the syllable *trrr*. At its breeding-grounds it utters a thick hoarse cry, which may be represented by the syllable *peezh*, generally uttered as the bird alights on the ground, and possibly a note of endearment between the sexes. In the pairing-season the male has a trill like most other Sandpipers.

The great migration of Dunlins takes place in May and September; but in Denmark eggs have been taken during the last week of April, whilst in the high north the birds do not reach their breeding-grounds until June. They seldom breed far from the coast, except where tidal rivers tempt them inland. The nest is difficult to find, unless the female, who is a close sitter, is flushed from it. The site chosen is generally the middle of a tuft of grass, or a bare place on the moor surrounded by heather or rushes. The nest itself is a mere depression, with occasionally a slender twig or two round the margin, and lined with a little dead grass, a few roots, or sometimes a little moss. The eggs, which are always four in number, are subject to great variation in colour, and are sometimes remarkably handsome. They are larger than the eggs of the Little Stint or American Stint, and smaller than those of the Purple Sandpiper and Common Snipe; but there are no variations of colour or spotting to be found in the eggs of these four species which are not occasionally found in eggs of the Dunlin. The ground-colour varies from pale green to pale brown and buff; the underlying spots are few, obscure and grey, but the surface-spots vary from rich reddish brown to nearly black; they are sometimes, chiefly at the large end, bold, and many of them confluent, but occasionally small and evenly distributed over the surface. On some eggs the blotches are oblique, resembling a common variety of the eggs of the Turnstone. They vary in length from 1·4 to 1·2 inch, and in breadth from 1·0 to ·9 inch.

As soon as the young are able to fly, which in this country is about the end of July, they collect in large flocks and migrate to the coast to feed. By September most of them have lost the greater part of their richly-coloured first plumage, and have almost assumed the winter dress of birds of the year.

The female Dunlin is, on an average, a slightly larger bird than the male, but it is not known that there is any difference between them in the colour of the plumage. In the adult in breeding-plumage the feathers of the crown of the head and the mantle are black, with rich bright chestnut margins, and the scapulars are black, not only margined but also mottled with chestnut; the feathers of the nape, wing-coverts, rump, and upper tail-coverts remain practically in winter plumage, being greyish brown with dark centres, a few feathers only, especially on the rump, being moulted in spring, when they appear with chestnut margins. The colour of the wings and tail is almost the same as in the Purple Sandpiper; the quills and the two centre tail-feathers are dark brown, the remaining tail-feathers are greyish brown, and a white bar across the wing (varying considerably in individuals) is conspicuous during flight, formed by the white tips of the greater wing-coverts and the white bases of the secondaries, some of the innermost of which are entirely white. The throat, breast, and sides of the neck are greyish white, each feather with a nearly black centre; the axillaries, under wing-coverts, flanks, and vent are nearly pure white, and the belly is nearly black. Bill, legs, feet, and claws black; irides hazel.

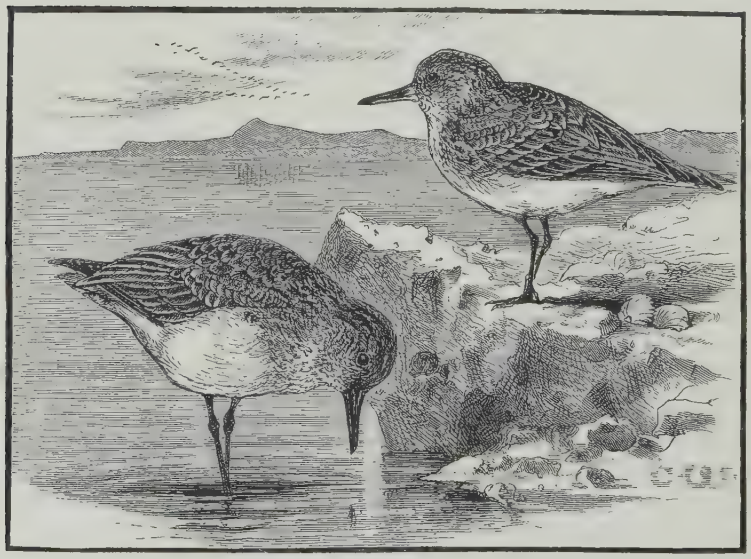
After the autumn moult the general appearance of the bird is entirely changed, but the colour of the wings, wing-coverts, innermost secondaries, rump, upper tail-coverts and tail, axillaries, under wing-coverts, flanks, and under tail-coverts remain the same. The head, nape, mantle, and scapulars are grey, the feathers having obscure paler margins and darker centres; whilst the whole of the underparts are pure white, except a few obscure streaks on the sides of the neck, on the upper breast, and on the sides of the lower breast. Young in first plumage somewhat resemble birds in breeding-plumage, but the rich chestnut margins of the feathers of the upper parts are replaced by chestnut, buff, and white, and extend to the feathers of the rump, the upper tail-coverts, the wing-coverts, and the innermost secondaries. The general colour of the underparts is white suffused with buff, and spotted with black on the breast and flanks. Birds of the year resemble adults in winter plumage, but retain the wing-coverts, innermost secondaries, rump, and upper tail-coverts of the young in first plumage. After its first spring moult the Dunlin resembles the Knot and the Curlew Sandpiper in having the greater portion of the chestnut of the upper parts replaced by white, which abrades during summer, causing the back to be very dark in colour. Young in down have the upper parts reddish brown, mottled with black and sprinkled with buff, and have the underparts buffish white.

American ornithologists imagine that the Dunlins on their continent are larger birds, with longer bills and wings and redder backs in summer plumage, than our birds, and that therefore they should be regarded as

subspecifically distinct, under the name of *Tringa alpina americana*. I cannot discern any difference of colour that is not common to various localities. There is a slight difference of size, as the following table of measurements shows :—

	Length of wing.	Length of culmen.
	in. in.	in. in.
Britain	4·8 to 4·3	1·5 to 1·2
Continental Europe . . .	4·7 to 4·1	1·5 to 1·2
Asia	4·9 to 4·4	1·7 to 1·3
America	4·9 to 4·4	1·7 to 1·4

All that can be said is that, on an average, European examples are not quite so large as those from the rest of the world. Some ornithologists think that we have two races of Dunlins in England—a small bright-coloured race and a larger duller-coloured one; but it has not been proved that the difference is not one of age or individual variation.



LITTLE STINTS.

TRINGA BONAPARTI.

BONAPARTE'S SANDPIPER.

(Plate 31.)

Tringa fuscicollis, *Vieill. N. Dict. d'Hist. Nat.* xxxiv. p. 461 (1819).
Tringa campestris, *Licht. Verz. Doubl.* p. 74 (1823).
Tringa schinzii, *Bonap. Syn. U.S. Birds*, p. 242 (1828, *nec Brehm*).
Pelidna schinzi, *Bonap. Comp. List B. Eur. & N. Amer.* p. 50 (1838, *nec Brehm*).
Tringa bonapartii, *Schleg. Rev. Crit.* p. 89 (1844); **et auctorum plurimorum—** *Baird, Cassin & Lawrence, Coues, Abbott, Sclater & Salvin, Blakiston*, &c.
Schæniclus schinzii (*Bonap.*), *Gray, List Birds Brit. Mus.* iii. p. 105 (1844, *nec Brehm*).
Pelidna dorsalis, *Licht. Nomencl. Av.* p. 92 (1854).
Actodromas (Heteropygia) bonapartii (*Schleg.*), *Coues, Proc. Philad. Acad.* 1861, p. 199.

Bonaparte's Sandpiper is another of those American species that occasionally wander across the Atlantic to the British Islands. Upwards of a dozen examples of this bird have been obtained, principally in October and November. The first specimen of Bonaparte's Sandpiper recorded in our islands was killed previous to 1839 near Stoke Heath in Shropshire (Eyton, Ann. Nat. Hist. ii. p. 53, and Gould, B. Eur. iv. no. 330). Since this record three examples have been obtained in the Scilly Islands, two in Cornwall, four in Devon, two in Sussex, and one in Middlesex. An example, said to have been killed in Ireland, is in the Belfast Museum. This bird does not appear to have been observed in any part of Europe except in the British Islands. It no doubt often escapes notice from its close resemblance to the Dunlin.

Bonaparte's Sandpiper breeds in the Arctic regions of North-east America and Greenland; but it has not occurred west of the Rocky Mountains. It passes through the United States and the Bermudas on migration, and winters in the West Indies, Central America, and the whole of South America*.

Bonaparte's Sandpiper passes northwards through the United States in May, on its way to its breeding-grounds in the Arctic regions. Its lines of migration appear to be inland as well as along the coast. It journeys in small flocks, and is said to be a very tame and gentle little bird. No Sandpiper is more gregarious and sociable, and not only does it keep in

* Bonaparte's Sandpiper is said to be a resident in Central Patagonia (Durnford, 'Ibis,' 1878, p. 404), and to breed on the Falkland Islands (Capt. Abbott, 'Ibis,' 1861, p. 157). If these wonderful statements are correct, they are profoundly interesting; but before they can be accepted as facts, unimpeachable evidence of their truth must be produced.

very close flocks, but associates with Dunlins, Stints, and other small species of shore-birds. Its habits are very similar to those of the other small Sandpipers. It runs actively about the shore, in search of its food, and often wades breast-deep in the water. It loves to haunt the muddy margins of inland lakes as well as the low-lying shores. Dr. Coues says that in Labrador Bonaparte's Sandpiper is very common during migration on the rocky coast, and was frequently seen on the large rocks which slope abruptly down to the water, tripping over the green slippery surface without showing any signs of fear at his presence. The flight of this species is rapid and rather unsteady, the bird alternately showing its upper and under surface. When alarmed the whole flock rises *en masse*, as if moved by a common impulse; and should any of its members be shot, the rest return and wheel above their companions, often alighting again on the same spot. The note of Bonaparte's Sandpiper is described by Dr. Coues as a low, soft *weet*, different from that of any other Sandpiper. Other American ornithologists describe it as a low lisping sound, neither mellow nor whistling.

The food of Bonaparte's Sandpiper consists of insects, worms, small mollusks, and crustaceans, and probably in summer this fare is varied with small ground-fruits. This bird searches for its food more amongst the mud and seaweed-covered rocks than on the sand.

But little is known of the habits of Bonaparte's Sandpiper during the breeding-season. Its nesting-places are in the Arctic regions on the wild lands near the Arctic Sea, or by the sides of the streams that fall into it. Its nest was discovered by MacFarlane; and eggs taken by him on the 29th of June and on the 3rd and 4th of July were found to be hard-set. The nest is described as a mere depression in the ground, in which a few dead leaves are collected to serve as a lining. The eggs are four in number. Those taken by MacFarlane are pyriform in shape, olive-brown or brownish olive in ground-colour, marked with boldish surface-spots of dark brown, and underlying spots of greyish brown. Many of the markings are confluent on the larger end of the egg. They measure 1·35 inch in length and ·95 inch in breadth. An egg in my collection is greyish buff in ground-colour, thickly spotted over the entire surface with reddish brown and with a few larger blotches intermingled of the same colour, and with numerous underlying markings of purplish grey and pale brown.

Bonaparte's Sandpiper appears only to rear one brood in the year, and soon after the young are strong on the wing the great southward journey commences. It has been noticed in the Northern States as early as the 20th of July on its migration south; but in Greenland the young birds do not start from their birthplace before the end of August or beginning of September. On migration this bird frequently joins flocks of Dunlins and other Waders.

Bonaparte's Sandpiper is a dull-coloured Little Stint, with the dimensions of a Dunlin, and resembles the first-mentioned bird in all the changes of its plumage, except that the streaks on the breast are more pronounced and extend to the flanks. It possesses, however, an important character which distinguishes it at all ages and seasons from its allies—its upper tail-coverts are always pure white, with a few dusky longitudinal streaks. Bill brown, paler at the base; legs, feet, and claws brown; irides hazel.

LITTLE STINT'S NEST.

TRINGA MARITIMA*.

PURPLE SANDPIPER.

(Plate 31.)

Tringa maritima, *Brünn. Orn. Bor.* p. 54 (1764) ; *Gmel. Syst. Nat.* i. p. 678 (1788) : **et auctorum plurimorum**—*Latham, Naumann, Temminck, Swainson, Audubon, Schlegel, Gray, Gould, (Bonaparte), (Coues), (Baird, Brewer, & Ridgway)*, &c.
Tringa nigricans, *Mont. Trans. Linn. Soc.* iv. p. 40 (1798).
Tringa canadensis, *Lath. Ind. Orn.* ii. *Suppl.* p. lxv (1801).
Totanus maritimus (*Gmel.*), *Steph. Shaw's Gen. Zool.* xii. pt. i. p. 146 (1824).
Trynga arquatella, *Pall. Zoogr. Rosso-Asiat.* ii. p. 190 (1826).
Arquatella maritima (*Gmel.*), *Coues, Proc. Phil. Acad.* 1861, p. 183.
Arquatella couesi, *Ridgw. Bull. Nutt. Orn. Club*, 1880, p. 160.

The Purple Sandpiper is a winter visitor to the British Islands, and is found somewhat locally distributed in all suitable portions of our coasts from Cornwall to the Orkney and Shetland Islands, Ireland, and the Hebrides, but it does not appear to have been noticed on the Channel Islands. A few birds sometimes linger in their winter-quarters throughout the summer; and it has even been suspected that the Purple Sandpiper has bred in some of the Outer Hebrides and in the Shetlands, but no thoroughly authenticated eggs from any of these localities have yet been taken. In its migrations the Purple Sandpiper is rather erratic; and, like the Snow-Bunting and the Waxwing, it is much commoner in some years than in others.

* Saunders, in his continuation of Newton's edition of 'Yarrell's British Birds,' has followed Dresser, Salvin, and the Committee of the 'Ibis List,' who revived the blunder long ago made by Fabricius, O. F. Müller, and Fleming in applying the name of *Tringa striata* of Linnæus to the Purple Sandpiper, instead of adopting the almost universally accepted name of *Tringa maritima*. It is too bad that ornithologists of such standing should thus capriciously complicate the synonymy of well-known birds to the despair of all good naturalists. The *Tringa striata* of Linnæus is founded upon the *Tringa totanus striatus* of Brisson; which Dresser himself admits to be the Redshank. It is true that Linnæus adds in his *Addenda* a fairly accurate diagnosis of the Purple Sandpiper as a synonym; but if he had intended it to supersede his own, he would have placed it in his *Errata*. The rump is described as white, the tail as barred with dusky and white, and the wings as being for the most part white. It is inconceivable how even the greatest craver after new names can possibly associate such a description for a moment with the Purple Sandpiper. The diagnoses of Linnæus are bad enough; but if they were as bad as Dresser and his friends infer that they are, the wisest course for ornithologists would be to relegate them to the waste-paper basket along with the synonymy of Brehm. It would perhaps have been unreasonable to have expected that so mischievous a mistake should have been corrected by the compilers of the 'Ibis List of British Birds.' Gross as the error is, it is only one out of a hundred others due to the carelessness of the Committee, who seem to have taken no pains whatever to correct the blunders of their predecessors.

The Purple Sandpiper might almost be regarded as a resident in the Circumpolar Region. It is a summer visitor to North Greenland, Spitzbergen, Nova Zembla, and the Taimur peninsula, but in South Greenland, Iceland, the Faroes, and on the Norwegian coasts it is a resident. It winters in some numbers on the southern shores of the North Sea, and sparingly on the northern shores of the Mediterranean. It probably breeds on both coasts of Behring's Straits and across Arctic America. It has not occurred in Japan; but I have a specimen in my collection, in winter plumage, obtained by Wosnessenski in the Kurile Islands. It winters on the shores of the Great Lakes, and on the coasts of New Brunswick, occasionally occurring on the Bermudas and the Azores. A solitary individual is said to have wandered as far as South Africa. The Purple Sandpiper is supposed to be represented on the Pribylov Islands, in Behring Sea, by *Tringa ptilocnemis*—a very doubtful species, which is said to have the feathers of the upper parts, in breeding-plumage, margined with buff instead of chestnut, and in winter plumage to have the general colour of the upper parts much paler.

The Purple Sandpiper's migrations are only comparatively small. Like the Snow-Bunting, this bird winters in great numbers as far north as it can with safety, frequenting the Arctic coasts that are free from ice. Some birds, however, wander along the coast as far as Gibraltar. The Purple Sandpiper usually makes its appearance on the British coasts in September; but it is far more numerous in October, and remains here until late in the following spring, departing in May to its breeding-grounds.

Unlike most of its congeners, the Purple Sandpiper loves a rocky coast, a bold shore where the rocks gradually shelve down into the water or are left exposed in huge masses at low tide. It is not often seen on a low sandy beach; but the wide, almost interminable, mud-flats which have such a charm for most wading birds are occasionally frequented by the Purple Sandpiper. It visits the coast in little parties; but now and then a solitary bird is met with, which will sometimes join a flock of Dunlins or other small Waders. In many of its habits the Purple Sandpiper differs considerably from its congeners. It loves to frequent the shore when the waves are dashing over the rocks, and to seek for its food literally surrounded by the spray. Nimbly the little creature trips so sure-footed over the wet slippery rocks, exulting in the wild strife of the waters, and appearing every moment as though the huge angry waves would overwhelm it. Tightly it clings to the boulders until each succeeding wave has broken, when its active search commences. When the gale is at its height it shuns the shore, or seeks safety and shelter amongst the rocks above high-water mark; and Saxby states that in Shetland he has known it to take refuge under the lee of a wall, and to feed within a few yards of his house.

The Purple Sandpiper is a very tame little bird, often allowing the

observer to approach within a few feet of it as it stands on the shore. Sometimes it is flushed with difficulty, or merely contents itself with running along the shore just out of arm's length. Saxby states that it is an excellent swimmer, and that he has seen as many as three or four in calm weather swimming at the base of the rocks on which their companions were searching for food. It never seems to dive, however, except when wounded. Sometimes, when flushed, it has been known to alight on the water several yards from shore. The food of the Purple Sandpiper is composed of marine insects, small crustaceans and mollusks, and the seeds of various shore-plants. It obtains most of its food as the tide comes in or ebbs, usually sitting on the rocks at high water, pluming itself, basking in the sun, and waiting for the sea to go down again. The flight of the Purple Sandpiper is rapid, but not usually very high. Sometimes it skims along for a short distance, hovers in the air, or runs along the ground with wings outspread over its back. The note of this bird somewhat resembles that of the Common Sandpiper: it is loud, clear, and shrill, and often repeated, but very difficult to express on paper—a kind of *ince*, not unlike the note of the House-Martin, but louder.

The breeding-season of the Purple Sandpiper commences, in the Faroe Islands, in the middle of May; but further north it is later, operations being postponed until summer has fairly set in. In these islands Wolley found the young birds unable to fly at the end of June. It is far from improbable that this bird breeds sparingly in the Shetlands. Saxby states that early in spring small parties were often met with on the tops of the hills several hundred feet above sea-level, and that he had eggs brought to him exactly resembling authentic eggs of this species. Wolley took its eggs in the Faroes, where he found it breeding sparingly on the extreme tops of high mountains. One pair made their nest in the centre of a colony of Skuas, whence he had the eggs in two successive years. Captain Feilden found a nest on those islands on the 20th of May on the fells between Thorshavn and Nordedhal. Before discovering the nest he almost trod upon the sitting bird, which fluttered along the ground, feigning lameness, trying to allure him away from the spot. The nest was merely a little hollow scraped in the scanty vegetation and lined with a few dried sprigs of moss. Sometimes the nest is built amongst short grass, close to the shore on some elevated ground; at others it is more inland, in a marshy place on the summit of a hill. It is always very slight, a small hollow, into which is scraped a little dead grass, which serves as a lining. The eggs of the Purple Sandpiper are four in number and remarkably handsome. They vary in ground-colour from pale olive to pale buffish brown, boldly mottled, blotched, and streaked with reddish brown and very dark blackish brown. On some eggs the blotches are large, and chiefly distributed in an oblique direction round the

large end; on others they are more evenly distributed over the entire surface; and on many a few very dark scratches, spots, or streaks are scattered here and there amongst the brown markings. The underlying markings are numerous and conspicuous, and are pale violet-grey or greyish brown in colour. The eggs vary in length from 1·55 to 1·45 inch, and in breadth from 1·1 to 1·0 inch. It is almost impossible to distinguish some eggs of the Purple Sandpiper from certain varieties of those of the Jack Snipe or the Common Snipe; but on an average the ground-colour of the eggs of the two latter species is less olive. Eggs of the Dunlin resemble very closely those of the Purple Sandpiper, but are smaller.

The Purple Sandpiper only appears to rear one brood in the year. As soon as the young are hatched the old birds are extremely anxious for their safety, and strive by many artifices to lure an intruder from them. Both birds apparently assist in the duties of incubation, but Collett never found any females tending the young birds. During the breeding-season the Purple Sandpiper obtains much of its food on the coast, coming from the adjoining hills on which it is breeding to feed on the shore at low water.

It is not known that there is any difference in the colour of the sexes of this species. In breeding-plumage the head, hind neck, mantle, and scapulars are dark greyish brown, each feather having a bright chestnut margin; the quills, wing-coverts, and innermost secondaries are greyish brown with obscure pale edges, and a white bar appears across the wing during flight, formed by the white tips of the greater wing-coverts and the white bases of the secondaries, some of the inner of which are entirely white; the rump, upper tail-coverts, and the two centre tail-feathers are dark brown, the remaining tail-feathers being grey. An obscure white streak passes over each eye, and the underparts are white, except on the breast and flanks, where the feathers are greyish brown, suffused with chestnut and margined only with white. Bill dark brown, paler at the base; legs and feet dull yellow, claws black; irides hazel. After the autumn moult all trace of chestnut has vanished from the plumage, the eye-stripe has almost disappeared, and the upper parts are suffused with a rich purplish gloss; the margins of the feathers are grey, and the dark centres of the feathers of the underparts are much more developed, the only pure white feathers being those on the centre of the belly and the axillaries. Young in first plumage closely resemble the adult in winter plumage, but every feather of the upper parts has a pale margin, pure white on the wing-coverts, mixed white and buff on the mantle, scapulars, and innermost secondaries, and buff only on the head, rump, and upper tail-coverts. Birds of the year are intermediate between young in first plumage and adult in winter plumage, being easily distinguished from the former by the absence of the buff margins on any of the feathers of the upper parts, and from the

latter by the pure white margins of the wing-coverts and innermost secondaries. Young in down closely resemble those of the Dunlin, the upper parts being rich rufous spotted and mottled with nearly black, and the underparts being greyish white suffused with buff on the breast*.

* It is a rather remarkable fact that the extreme beauty of the young in first plumage of this species, which is by no means uncommon on our coasts in September, has not tempted Dresser or Saunders to describe it. It is needless to say that it is carefully described by Naumann, as well as by Baird, Brewer, and Ridgway. The latter writers separate this species into two forms, believing that examples obtained on the Aleutian Islands are much more chestnut on the upper parts in breeding-plumage, more streaked with white on the throat in winter plumage, and that the young in down are much more rufous. It appears to me that the alleged differences are principally those of age and season. Their descriptions of the summer plumage of the European form and of the winter dress of the American species are those of not fully adult birds, whilst that of the young in down of the European form is that of some other species.

TRINGA PLATYRHYNCHA.

BROAD-BILLED SANDPIPER.

(Plate 27.)

Tringa platyrincha, *Temm. Man. d'Orn.* p. 398 (1815); **et auctorum plurimorum** —*Gray, Gould, Blyth, (Dresser), (Saunders)*, &c.
Tringa eloroides, *Vieill. N. Dict. d'Hist. Nat.* xxxiv. p. 463 (1819).
Tringa platyrhyncha (*Temm.*), *Meyer, Taschenb. Zus. u. Ber.* iii. p. 259 (1822).
Pelidna platyrhyncha (*Temm.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 50 (1838).
Limicola platyrhyncha (*Temm.*), *Gray, List Birds Brit. Mus.* iii. p. 107 (1844).
Limicola hartlaubi, *Verr. Vinson's Voy. Madag.*, Ann. B, p. 5 (1865).
*Limicola sibirica, *Dresser, Proc. Zool. Soc.* 1876, p. 674.
Limicola pygmæa (*Lath.*), *apud* (*Bechstein*), *Koch, Naumann, Keyserling & Blasius, Savi, Schlegel*, &c.

It is rather singular that a bird breeding on the fells of Scandinavia should so rarely find its way, on its annual migrations, to the British Islands. There can be little doubt that it is often overlooked, and that the half-dozen specimens which have been recorded do not fairly represent the frequency of its visits. The Broad-billed Sandpiper was first made known as a British bird in 1836, by Mr. Hoy, who stated that an example was shot on the mud-flats at Breydon, in Norfolk, on the 25th of May of that year (Hoy, Mag. Nat. Hist. x. p. 116). Since that date two other examples have been obtained in the same locality—one, now in Mr. J. H. Gurney's collection, obtained about the end of May 1856 (Gurney, 'Zoologist,' 1856, p. 5159), and the other on the 23rd of April, 1868 (Stevenson, 'Birds of Norfolk,' ii. p. 361). A fourth specimen of this Sandpiper was obtained at Shoreham, in Sussex, in October 1845 (Borrer, 'Zoologist,' 1845, p. 1394); whilst a fifth was shot, in April 1863, at Hornsea Mere in Yorkshire (Cordeaux, 'Birds of the Humber,' p. 135). A sixth British example was captured in Belfast Bay on the 4th of October, 1844 (Thompson, Ann. Nat. Hist. xv. p. 309).

The Broad-billed Sandpiper is a very local bird during the breeding-season, but its range extends from the Atlantic to the Pacific. Wolley found it breeding near Muonioniska in lat. 68°; and on the Scandinavian

* Oates, in his 'Birds of British Burmah,' recognizes the validity of Dresser's species, and Legge, in his 'Birds of Ceylon,' regards it as an eastern form of the European species; but Saunders, in his continuation of Newton's edition of Yarrell's 'British Birds,' has very justly pointed out that the differences are not those of geographical distribution, but merely of age, Dresser's alleged eastern species being the young after its first spring moult, a plumage which, together with that of the bird of the year, he persistently ignores in describing most of the Waders treated of in his 'Birds of Europe.'

mountains it breeds in considerable abundance as far south as lat. 60°. There appears to be no foundation for the statement that it has occurred at Archangel. Harvie-Brown and I did not meet with it in the Petchora, but Bogdanow records it from the Volga; Sabanaeff does not record it from the Ural; neither did Finsch meet with it in the valley of the Obb. It has not been recorded by any Siberian traveller from the Yenesay; neither did Middendorff meet with it on the Taimur peninsula. Dybowsky obtained a single example near Lake Baikal; and Middendorff only met with it on the southern shores of the Sea of Ochotsk. Neither Prjevalsky nor Severtzow met with this species; but it occasionally occurs on migration on the coasts of Europe and Japan. It winters in the basin of the Mediterranean and North Africa, on the Mekran coast, and the coasts of North India, occasionally straying as far south as Madagascar, Ceylon, and the Andaman Islands. It has also occurred during the cold season in Burma, the Malay peninsula, Java, the Philippine Islands, Formosa, and China.

The habits of the Broad-billed Sandpiper are only imperfectly known, especially during winter. It is said by Naumann to pass through Germany in small numbers late in April or in May, returning from the north in August and September. It is seen on the coasts of Denmark about the same dates, and occurs very sparingly on Heligoland on migration. During winter the Broad-billed Sandpiper congregates in small parties, sometimes flocking with Dunlins and Stints, but occasionally roaming about alone. In its habits, so far as they are known, it does not appear to differ much from the other Sandpipers. It frequents the coast in winter, running about the sand and mud like a Dunlin, which bird it is said very closely to resemble in its flight. Its food consists principally of insects in summer; but in winter worms, crustaceans, and other small marine animals are picked up on the shore.

The Broad-billed Sandpiper was fortunate enough to come under the notice of Wolley, who found it during the breeding-season near Muonioniska in Lapland, and sent an account of his discoveries of its nest to Hewitson, who published it in his 'Eggs of British Birds.' Wolley states that the Broad-billed Sandpiper chooses for its nesting-ground open soft places in the marshes, where little else but bog-moss and sedge can grow, and that the nest is often placed on a low tuft of herbage just rising above the water. He found it weary work exploring the swamps and bogs in search of the eggs of this bird, the plague of mosquitoes and the difficulties of locomotion being quite sufficient to damp the ardour of any one but an enthusiast. He says that the Broad-billed Sandpiper's eggs are laid about the third week in June, "just when the thickest clouds of gnats rise from the water, which is so generally spread over the recently thawed land." He found many empty nests in proportion to those that were occupied:

they were neatly rounded hollows, lined with a few bits of dry grass. Sometimes the sitting bird ran from the eggs, sometimes she flew from them; and if incubation had advanced she returned to her charge even while the nest was surrounded by men.

Equally interesting are the notes on the breeding of this bird which Mr. Richard Dann communicated to Yarrell's 'British Birds,' written during his visits to Norway. He found it at the head of the Gulf of Bothnia, in grassy morasses and swamps, in small colonies, generally in places frequented by the Wood-Sandpiper. He also met with it breeding on the Dovrefjeld, in the great swamp of Fokstuen, three thousand feet above the level of the sea, a locality whence nearly all the eggs of this bird in collections have been obtained. It arrived at its breeding-grounds about the end of May, and was at first very wild and shy, obtaining its food on the grassy margins of the pools and lakes in the swamps. When disturbed, it soared for a considerable height, rising and falling like a Snipe, and uttering notes resembling *two woo,* rapidly repeated. As the season advanced and the weather became warm the bird's habits changed remarkably: it skulked in the dead grass, creeping through the herbage, and when flushed dropped again almost directly. Mr. Dann found fresh eggs on the 24th of June; and during the last week of July the young birds were unable to fly. The nest was placed on a tuft of grass, and resembled that of a Snipe. When the young were hatched the old birds were flushed with difficulty, and spent most of their time on the ground, skulking with their broods amongst the luxuriant vegetation of the morasses.

The eggs of the Broad-billed Sandpiper were also obtained by Mr. Mitchell, in the latter locality, during the last half of May 1873. He found several nests in an open part of the marsh, and noticed that the lining was similar in colour to the eggs, the dark varieties being laid on withered leaves of the mountain-willow and the lighter ones on dead grass. He states that the nests were better built than is usually the case with Sandpipers, the hole being scratched deeper and more carefully lined. The old birds sat very closely, not leaving the nest until almost trodden upon. Collett also found the Broad-billed Sandpiper breeding in these extensive swampy tracts of the Dovrefjeld. He met with it for several successive seasons inhabiting the tracts of marshy ground which were sparsely overgrown with sedge. One of the nests which he found on the 9th of June contained four slightly incubated eggs, and was built in the most swampy part of the ground. The parent birds kept in the vicinity, and exhibited considerable anxiety for their eggs.

The eggs of the Broad-billed Sandpiper are four in number, buffish white in ground-colour, thickly mottled and spotted with rich chocolate-brown and numerous small underlying markings of violet-grey. Some eggs are so thickly marked as to conceal most of the ground-colour;

others are more sparingly marked, having most of the spots clustered on the large end, where many of them are confluent, and on these the underlying markings are larger than usual. They vary in length from 1·38 to 1·25 inch, and in breadth from ·95 to ·87 inch. It is not easy to confuse them with those of any other British bird; but some varieties of the eggs of the American Stint resemble them in colour, though they are much smaller.

The Broad-billed Sandpiper only appears to rear one brood in the year, and the old birds are devotedly attached to their young. Both birds assist in incubating the eggs, for Collett found sitting-spots on the breast of both sexes. After the breeding-season the birds unite into little parties, which keep company during the winter.

It is not known that there is any difference between the sexes in this species in the colour of their various plumages, which closely resemble those of the Little Stint. The adult in breeding-plumage has the general colour of the upper parts blackish brown, most of the feathers margined with chestnut, but a few of them with white; the quills are brown, and a white bar is conspicuous during flight, formed by the white tips of the primary and greater wing-coverts; the smaller wing-coverts retain the greyish-brown plumage of winter, not being moulted nor changing in colour in spring; the rump, upper tail-coverts, and two centre tail-feathers are coloured like the back, the remaining tail-feathers being greyish brown. The feathers over the eye and on the neck, breast, flanks, and the under tail-coverts are white, with brown centres, the rest of the underparts being pure white. Bill dark brown, paler on the under mandible; legs, feet, and claws greenish black; irides hazel. After the autumn moult the prevailing colour of the upper parts is brownish grey, each feather having an obscure dark centre (most developed on the rump and upper tail-coverts) and an indistinct pale margin; the underparts are pure white, streaked with brownish grey on the neck and breast. Young in first plumage differ from adults in breeding-plumage in having the chestnut margins of the feathers of the upper parts more developed, the white margins less so and suffused with buff, as are also the wing-coverts; the breast is also suffused with buff, and the streaks are much less distinct. Birds of the year probably only differ from adults in winter plumage in having the wing-coverts of the young in first plumage. After the first spring moult the Broad-billed Sandpiper resembles the Little Stint in having the chestnut margins of the feathers of the upper parts broader, and the spots on the breast fewer and less defined. Young in down resemble those of the Dunlin, but the ground-colour of the plumage is much greyer.

TRINGA PECTORALIS.

PECTORAL SANDPIPER.

(Plate 68.)

Tringa cinclus dominicensis, *Briss. Orn.* v. p. 219 (1760).
Tringa maculata, *Vieill. N. Dict. d'Hist. Nat.* xxxiv. p. 465 (1819).
Pelidna pectoralis, *Say, Long's Exp.* i. p. 171 (1823); **et auctorum plurimorum**
—(*Cassin*), (*Bonaparte*), (*Nuttall*), (*Audubon*), (*Reinhardt*), (*Jenyns*), (*Yarrell*), (*Eyton*), (*Keyserling & Blasius*), (*Macgillivray*), (*Temminck*), (*Schlegel*), (*Gray*), (*Meyer*), (*Sundevall*).
Schænicola pectoralis (*Say*), *Gray, List Birds Brit. Mus.* iii. p. 104 (1844).
Tringa dominicensis, *Degl. Orn. Eur.* ii. p. 232 (1849).
Pelidna maculata (*Vieill.*), *Bonap. Compt. Rend.* xliii. p. 596 (1856).
Actodromas maculata, *Coues, Proc. Ac. Nat. Sci. Philad.* 1861, pp. 197, 230.

The Pectoral Sandpiper has occurred so often in the British Islands that it may fairly be regarded as an irregular straggler on autumn migration. Of the numbers that pass along the Atlantic coasts of North America, and cross the Bermudas annually on their journey southwards, it is only reasonable to expect that a few may take the wrong direction, or get blown out to sea by gales, and after safely crossing the Atlantic, strike some part of the British coasts. The first example of the Pectoral Sandpiper to be honoured with a record was obtained on the 17th of October 1830, on the borders of Breydon Broad, a large sheet of water near Yarmouth in Norfolk. It proved to be a female (Hoy, Mag. Nat. Hist. 1837, i. p. 116). Since then three other examples have been obtained in Norfolk, of the authenticity of which there is no doubt; four have been captured in Scilly, one in Cornwall, two in Devon, one in Sussex, one in Suffolk, one in Yorkshire, one in Durham, and two in Northumberland. Only two examples have been recorded from Scotland, one in Dumbartonshire and one in Aberdeenshire. Of these occurrences fourteen were on autumn migration from August to October, and two on spring migration in May and June. Curiously enough, this American Sandpiper has not yet been detected in Ireland, but there can be little doubt that it has been overlooked in that country. There is no record of this species occurring in any part of continental Europe.

The Pectoral Sandpiper is probably confined to Arctic America during the breeding-season. It has occurred as far west as Alaska, and as far east as Greenland. It passes through the United States on migration, and visits the Bermuda Islands regularly, sometimes in enormous flocks. It winters in Mexico, the West Indies, Central America, and probably throughout South America.

The Pectoral Sandpiper has two very close allies. One of these, *Tringa bairdi*, has nearly the same range; it is a smaller bird, slightly paler in colour, and has black feet. The other, *Tringa acuminata*, breeds in Eastern Siberia and Alaska, passes through China and Japan on migration, and winters in the islands of the Malay archipelago and Australia. It is about the same size as the Pectoral Sandpiper, but differs in the shape of the tail, which is graduated and composed of pointed or acuminated feathers, those in the tail of the American species being rounder and even, except the two centre ones, which are longer than the rest and pointed. The Siberian species has the flanks as well as the breast streaked in the adult summer plumage, but there are no streaks on the breast of the young in first plumage; otherwise the two species are remarkably alike.

The Pectoral Sandpiper is a common and well-known bird during the two seasons of migration in the United States, passing to and from its northern breeding-grounds by inland routes across the prairies and down the great river-valleys as well as along the coasts. Its spring migration commences in April and lasts until the end of May, and its southward journey begins in August and lasts until the end of September, or even into October. On its passage to and fro the Pectoral Sandpiper frequents muddy shores, salt-marshes, inundated meadows, and extensive sands. In many of its habits it is said closely to resemble the Dunlin. Sometimes it gathers into very large flocks, whilst at other times it is only met with in scattered pairs or even alone. It is a very tame bird and admits of a close approach, and when shot at the uninjured birds merely fly a little distance and then alight. Its flight is quick, the wings being much bent; and sometimes, when the bird is flushed suddenly, it makes off in an erratic manner like a Snipe. When disturbed, an entire flock will frequently turn and glide in the air, performing various graceful evolutions ere settling on the sands or marshes again. Sometimes they rise to a considerable height, circling overhead for a short time, and then dart rapidly down to the place whence they were flushed.

When engaged in feeding, the flock becomes scattered, the birds running about in different directions in active busy search for food. Upon the ground they run and walk, usually with the head bent downwards. Sometimes they wade into the little pools or follow the receding waves eagerly to pick up any little tempting morsel that may chance to be stranded, and then rush with surprising agility out of the way of the rollers coming in. The food of the Pectoral Sandpiper is composed of insects, crustaceans, and small shell-fish. Small particles of plants have been found in its stomach, as well as seeds, and small pieces of grit are swallowed to aid in digestion. When flushed the Pectoral Sandpiper utters a note resembling the syllable *tweet*, which is said not to be often repeated unless the bird is apprehensive of some danger. During winter this bird not

unfrequently congregates with other species, such as Knots and Stints; but at all times it seems to show a preference for marshes rather than mud-flats, and resembles the Snipes in this respect far more than the typical Sandpipers.

Of the breeding-habits of the Pectoral Sandpiper nothing yet has been published, but its eggs were obtained by Lieutenant Ray near Point Barrow in Alaska during the last week in June 1883. They are very handsome eggs, and closely resemble in colour those of the American Stint, though they are more than twice the size. The ground-colour varies from pale buff to pale olive-brown; the surface-spots are very large and irregular in shape and generally of the richest reddest brown. Where the surface-spots are not so crowded as to become confluent and hide the ground-colour the grey underlying spots are very conspicuous. An egg belonging to the Smithsonian Institution, kindly lent me to be figured, measures 1·55 inch in length and 1·05 inch in breadth.

The Pectoral Sandpiper is neither more nor less than a giant form of the Little Stint; the proportions are the same, but in every dimension it is one third larger. The description of one bird, so far as colour is concerned, will apply to the other in all the stages of their plumage*, with two exceptions—the legs and feet of the Pectoral Sandpiper are buff, and the breast is of a slightly different colour. The ground-colour is always grey—in young in first plumage, and in adult in summer, profusely streaked with dark brown, but in winter, both in the adult and in birds of the year, only sparingly so.

* Dr. Coues is wrong in stating (Key N. Amer. Birds, 2nd ed. p. 627) that this species is "not known to have a plain ashy and white winter plumage like most Sandpipers." Winter examples in the collection of Messrs. Salvin and Godman, and in my own, from Central America, exactly resemble in colour winter examples of the Little Stint, except that the breast is greyer and more streaked.

TRINGA MINUTA.

LITTLE STINT.

(Plate 31.)

Tringa cinclus minor, *Briss. Orn.* v. p. 215 (1760).
Tringa pusilla, *Linn. apud Lath. Gen. Syn. Suppl.* i. p. 292 (1787).
Tringa minuta, *Leisler, Nachtr. Bechst. Naturg. Deutschl.* i. p. 74 (1812); **et auctorum plurimorum** — *Temminck, Naumann, Schlegel, Newton, Dresser, Saunders,* &c.
Pelidna minuta (*Linn.*), *Boie, Isis,* 1826, p. 979.
Actodromas minuta (*Linn.*), *Kaup, Natürl. Syst.* p. 55 (1829).
Schæniclus minuta (*Linn.*), *Gray, List Birds Brit. Mus.* iii. p. 106 (1844).

Although the Little Stint was first described by Leisler in his Supplement to Bechstein's 'Natural History of Germany,' it was well known to Pennant, Latham, and other early British ornithologists under the name of the Little Sandpiper, and it was supposed to be identical with the *Tringa pusilla* of Linnæus, a name which was founded upon "La petite Alouette-de-mer de S. Domingue" of Brisson. The latter proving to be the Semipalmated Sandpiper, a perfectly distinct species, it was necessary to give a new name to the European bird.

This interesting and charming little Sandpiper is only known as a visitor on migration to the British Islands. The east coast of Great Britain, as far north as the Shetlands, is its principal haunt, whence as the season advances it migrates along the south coast, many reaching as far as Cornwall. It does not yet appear to have been observed on the west coast of Scotland, and is very local, and only occurs in small numbers, on the west coast of England, chiefly in the north. It visits Ireland in small numbers on migration, and is chiefly observed on the east coast. It is known to pass the Channel Islands on migration in autumn.

The Little Stint breeds in great numbers, though very locally, on the Siberian tundras, above the limit of forest-growth, from the North Cape to the Taimur peninsula. It has also been seen in summer on Waigatz Island and on Nova Zembla. It passes along the European coasts, the valleys of the Kama and the Volga, and through West Siberia and Turkestan on migration, to winter in suitable localities throughout Africa, including the valley of the Nile, and in Persia, India, Ceylon, and Burma.

The Little Stint has three close allies with which it is very often confounded, and with two of which it is probably conspecific.

The most distinct of these is *Tringa subminuta,* which may always be

distinguished by having no white on the shafts of any of the primaries except the first. Its large pale feet (the middle toe and claw measuring nearly an inch) distinguish it from *T. minuta* and *T. minuta ruficollis* (but *T. minuta minutilla* is more or less intermediate in this respect). This species has only been found during the breeding-season on the northern and western shores of the Sea of Ochotsk; but as it is recorded as passing through Lake Baikal on migration, it probably breeds also in the valley of the Lena below the Arctic circle. It is also known to pass the valley of the Amoor and the coasts of Japan and China on migration, to winter in the islands of the Malay archipelago, Burma, India, and Ceylon.

On the American continent a form of the Little Stint, *T. minuta minutilla*, is found, which is on an average a smaller bird, and presents some other slight differences, which are pointed out in the next article.

The summer plumage of the extreme form of *T. minuta ruficollis* is very different from that of the typical bird, the chin, throat, and upper breast being unspotted chestnut (the spots on the underparts being principally confined to the lower breast), and the two centre tail-feathers being brownish black, with no chestnut margins. Unfortunately, however, for its specific distinctness, a perfect series from one form to the other may be found, and it is doubtful if any distinction can be drawn between the two forms in fully adult winter plumage. Middendorff found this form during the breeding-season on the southern shores of the Sea of Ochotsk, and Pallas originally described it from Dauria. On migration it passes Lake Baikal, Japan, and China, and winters in the Malay archipelago and Australia; but there does not appear to be any evidence that it has ever occurred in India or Burma.

The habits of the Little Stint can only be observed in our islands during its brief stay in spring and autumn as it passes to and from its Arctic breeding-grounds. A few birds usually make their appearance in August, and as the autumn advances they become much commoner and spread themselves along the coasts. Here they remain until late in October, then pass on again. It returns in May, many lingering until the middle of June on the flat shores of this country, waiting for the snow to melt which covers its nesting-places. A few individuals possibly linger here all the summer, but do not breed. In its habits the Little Stint very closely resembles the Dunlin. It often flocks with those birds, as well as with Sanderlings. It loves to frequent the bright open sands, extensive salt-marshes, mud-flats, and estuaries, where it may be seen running about in true Sandpiper style in search of its food. It frequently runs along the wet sand close to the water-side, following the waves as they retire, and tripping hastily before them as they break and sweep in again. It is an active, graceful little creature, and when not much alarmed a very tame one. When frequenting the sandy shores in autumn, sometimes in considerable flocks, it

often performs very graceful evolutions in the air, every bird actuated by one impulse, now turning their backs, then their pure white underparts to the observer, as the flock rises, spreads out, closes, or wheels, like a gigantic animated net.

The food of the Little Stint is composed of insects of various kinds and their larvæ, worms, crustaceans, and other small marine animals. It also feeds on small seeds, and in summer berries and small ground-fruits are probably eaten.

Of all the discoveries which my friend Harvie-Brown and I made in the Petchora during our visit there in 1875, there was nothing to which we devoted more time and trouble, and which gave us greater pleasure, than the discovery of the breeding-place of the Little Stint; and after all we found it almost by a fluke. In 1872 Alston and Harvie-Brown procured a specimen of this interesting bird in full summer plumage on an island in the delta of the Dvina on the 21st of June; and in the same year Collett found it common on the island of Tamsö, in the Porsangerfjord, in July; and we had made up our minds that we would strain every nerve to bring home eggs of the Little Stint, especially as no authenticated specimens were known to exist in the cabinet of any ornithologist.

As soon as the ice on the great river Petchora broke up, migratory Waders began to arrive in small parties; and we shot considerable numbers of them as they fed upon the grassy banks of the swollen stream, in the hope of finding the Little Stint, but in vain. The Wood-Sandpiper and Temminck's Stint arrived on the 26th of May, and were soon common enough. A few days afterwards we met with the Terek and the Common Sandpipers; and before we reached the delta we found Temminck's Stint breeding sparingly on the banks of the river. At Alexievka and the adjacent islands the latter bird was abundant, and by the middle of July we had taken young in down; but up to this date we had seen no trace whatever of the Little Stint. Nevertheless we did not despair. On the tundra opposite Alexievka we found the Dunlin and the Grey Plover breeding—two birds that we had not seen at all on migration; so that it was obvious that many birds did not pass Ust Zylma on their way to the tundra. We consoled ourselves with the theory that these birds, as well as the Little Stint, were more maritime in their habits than Temminck's Stint and the other Waders we had seen at Ust Zylma, and would probably come round by the Baltic or the coast of Norway.

It was not until the middle of July that we were able to visit the islands at the mouth of the Petchora. Alexievka is the lading-port of the Petchora Timber-trading Company. Every autumn ships arrive to load with larch for Cronstadt; and to enable those ships to enter the lagoons of the Petchora, and navigate its difficult waters, various beacons and other signals have to be placed on sundry islands, promontories, and sand-banks.

The rafts which bring down the timber from the interior also frequently require help when the water of the Petchora begins to subside; and, for these and other purposes connected with the business of the company, a steamer is kept at Alexievka during the few summer months of the year. The beacons on the Golievski banks are washed away every spring by the ice; and on the 13th of July Captain Engel invited us to accompany him on his annual trip to replace or repair them. We gladly seized the opportunity, and spent about four hours on island No. 4 and a couple of hours on island No. 3. The former island, and as much of the latter as our limited time enabled us to explore, consists of barren sand-banks without a blade of grass upon them. Nevertheless we found them frequented by large flocks of Dunlins and small parties of Sanderlings, which were feeding at the water's edge and in the shallow pools left by the tide. They were very wild, and we had some difficulty in getting within shot.

We left the islands deeply lamenting our inability to explore them further; and having dropped a carrabas on the William Bank, and a long pole, with a besom on the top and a large stone at the bottom, upon the Alexander Bank, we passed Cape Constantinovka, and cast anchor at Dvoinik, or "the twin capes." The beacon on the promontory had been destroyed by the Samoyedes; and a new one had to be erected, which gave us a couple of hours to explore the country. As soon as we landed we struck out at once to the tundra. We had not gone far before we came upon what we at once recognized as Grey-Plover ground; and we very soon heard the familiar cry of a pair of these birds, who showed by their actions that they had eggs or young near. Harvie-Brown stopped to watch them, and I went on alone; but finding that the character of the tundra did not vary much as far as the eye could reach, I turned sharp to the north towards a range of sand-hills lying between the sea and a number of lakes. As soon as I reached the nearest of these lakes I caught sight of a large flock of Sandpipers flying up and down the bank. They were very wild; but by hiding amongst some dwarf willows in a cleft of the edge of the tundra, I succeeded in getting a shot at them and dropped three to the ground. A smaller flock passed by directly afterwards, out of which I secured two. To my intense delight these five birds were all Little Stints, at last. On dissection they all proved to be males.

It was not until the 22nd of July that we were able to visit Dvoinik again. On that day the steamer was placed at our disposal, thanks to Captain Arendt: and on our arrival we dismissed it for a week, and took possession of a wrecked ship lying high and dry on the beach not far from Dvoinik.

As soon as we had landed our stores, we started off in the evening in high glee for a raid upon the Little Stints. We hastened down to the

shores of the lake, where I had seen the birds before, and carefully searched the sand-hills and the other lakes, but found no trace whatever of any breeding-station, only a flock of small Sandpipers occasionally to be seen, but so wild that we could not get within range. We then separated for a stroll on the tundra. I had not gone far before I heard our interpreter Piottuch shouting in a state of great excitement. Harvie-Brown was the first to come up; and I joined them shortly afterwards. I found them sitting on the ground with a couple of Little Stints in down. I sat down beside them, and we watched the parent bird as she was fluttering and flying and running all round us, sometimes coming within a foot of one of us. After securing the old bird we went on a short distance, and Piottuch again made loud demonstrations of delight. This time it was nest and eggs. The nest was like that of most Sandpipers, a mere depression in the ground, with such dead *maroshka* (cloudberry) leaves and other dry material as was within easy reach scraped together to serve as lining. The position was on a comparatively dry extent of tundra, sloping from the top of the little turf cliffs that rise from the lagoon down to the sand-hills at the twin capes, between which the tide runs in and out of a little inland sea. These sand-hills are flanked on the side next the sea with piles of drift-wood, of all sizes and shapes—lofty trees which have been mown down by the ice when the great river broke up and in many places overflowed its banks, squared balks of timber washed away by the floods from the stores of the Petchora Timber-trading Company, and spars of luckless ships that have been wrecked on these inhospitable shores. They are sparingly sprinkled over with esparto grass, and soon run into an irregular strip of sand and gravel. This part of the coast, however, does not seem to have any attraction for the Little Stints. There were plenty of Ring-Plovers upon it and a few Temminck's Stints; and we saw a pair of Snow-Buntings with five young, which had probably been bred amongst the drift-wood. At Dvoinik, however, for perhaps a verst from each twin cape, between the sand and the mouth of the little inland sea, is an extent of dead flat land, covered over with thick short grass, and full of little lakes, mostly very shallow and filled with black or coffee-coloured mud with an inch or two of brackish water upon it. Some of these pools are covered with aquatic plants and others are open water. These lakes and pools seem to be the real point of attraction; and on their edges the Little Stints feed in small flocks of from half a dozen birds to a score, as they happen to meet from the tundra. The large flock of perhaps a hundred or more birds, which was occasionally seen, might possibly have been last year's birds and not breeding; but more probably it consisted entirely of males, which, so far as we had an opportunity of observing, do not take any part in incubation. The ground where the nests were placed was full of tussocks or hummocks, close together, the swampy ground between being

almost hidden, or traceable only by rows of cotton-grass. The tussocks are covered with green moss, with now and then a little reindeer-moss; but this undergrowth is almost hidden with cloudberry, a few species of *Juncus*, and sundry *Carices*, with occasionally a few dwarf shrubs and flowers of the tundra. The nests were within a hundred yards of the place where I shot the five Little Stints on the 14th of July, on a comparatively dry extent of tundra, gently sloping towards the north-east, lying between the lagoon and the inland sea—exactly the place in which one would expect them to breed, not too swampy, but probably the coolest place the birds could have chosen. The Pytkoff Mountains, though at a considerably greater elevation (513 feet above the level of the sea), are, no doubt, warmer, because more inland. The sandy shore, having little or no cover, would also be hotter from the sun. Facing the north-east, this part of the tundra catches most of the prevailing winds at this season of the year and the least sun; and no doubt the large bay or inland sea on one side and the open water on the other help to cool the air. The choice of a breeding-place bears only a secondary relation to latitude, longitude, or elevation. It is inaccurate to state that at the westerly or southerly limit of their distribution birds breed at the greatest elevation: this may or may not be the case, according to circumstances. The whole question is doubtless one of temperature; and the true statement of the case must be, that at the *warmest* limit of their distribution birds choose the *coolest* locality in which to breed—a statement which almost amounts to a platitude, but one, nevertheless, that cannot be too constantly remembered by field-naturalists in search of undiscovered breeding-grounds.

Our next nest was taken on the 24th of July. Harvie-Brown and I had been up all night, shooting by the light of the midnight sun, hoping to avoid the mosquitoes, and were returning home to our wrecked ship in a thick white morning mist. I stopped behind to refresh myself with a plunge in the sea, and afterwards turned towards the Little-Stint ground. Just as I reached it I was glad to see Piottuch emerge from the white mist, with the intelligence that he had found another nest of the Little Stint, containing four eggs, about three versts off, and had shot the bird, leaving the nest and eggs for us to take. We walked on together a short distance, when I heard the now familiar cry of a Little Stint behind me, a sharp *wick*, almost exactly the same as the cry of the Red-necked Phalarope or that of the Sanderling. Turning quickly round I saw the bird flying past as if coming up from its feeding-grounds; it wheeled round us at some distance and alighted on the ground about eighty yards ahead. We walked slowly up towards it, and stood for some time watching it busily employed in preening its feathers. By-and-by we sat down. It presently began to run towards us, stopping now and then to preen a feather or two. Then it turned back a few paces, and, lifting its wings, settled down, evidently

on its nest. We gave it three minutes' grace, to be quite sure, and then quietly walked up to the place, and sat down, one on each side of the eggs. The bird as quietly slipped off the nest, and began to walk about all round us, now and then pecking on the ground as if feeding, seldom going more than six feet from us, and often approaching within eighteen inches. It was a most interesting and beautiful sight. The tameness of the bird was almost ludicrous. We chatted and talked; but the bird remained perfectly silent, and did not betray the slightest symptom of fear or concern, *until I touched the eggs*. She then gave a flutter towards me, apparently to attract my attention. I turned towards her, and she resumed her former unconcern. I stretched my hand towards her. She quietly retreated, keeping about two feet from my hand. She seemed so extremely tame that I almost thought for the moment that I could catch her, and getting up on all fours I crept quietly towards her. As soon as I began to move from the nest, her manner entirely changed. She kept about the same distance ahead of me; but instead of retreating, with the utmost apparent nonchalance she did everything in her power to attract me still further. She shuffled along the ground as if lame; she dropped her wings as if unable to fly, and occasionally rested on her breast, quivering her drooping wings and spread tail as if dying. I threw one of my gauntlets at her, thinking to secure her without damage, but she was too quick for me. Piottuch then fired at her and missed. He followed her for some distance; but she kept just out of range, and finally flew away. We waited about a quarter of an hour at the nest, talking and making no effort to conceal ourselves, when she flew straight up and alighted within easy shot, and I secured her. The Little Stint seems to be a very quiet bird at the nest, quite different from Temminck's Stint. When you invade a colony of the latter birds, especially if they have young, the parents almost chase you from the spot —flying wildly round and round and crying vociferously, often perching upon a stake or a tree, or hovering in the air and trilling. We observed none of these habits in the Little Stint. So far as we saw, only the female takes part in incubation, and only the female is seen near the nest. On our way back to the wreck we met with a party of Sanderlings on the shore, and shot two of them. No doubt these birds were breeding somewhere in the district.

After a good dinner of Willow-Grouse and a siesta of three hours, we started to take the nest that Piottuch had marked. Whilst we had slept, the weather had changed. The mosquitoes had all gone. A smart gale was blowing from the north, and a heavy sea was breaking on the shore. It was cloudy, and dark, and cold, with an attempt now and then at rain. The nest was a couple of miles off, very near the shore of the inland sea, but on somewhat similar ground—moss, cloudberry, grass, &c. The eggs were intermediate in colour between those of the other two nests. On our

return to our quarters we found that our Samoyede servant had caught a young Little Stint, halfgrown, a very interesting bird. Like the young of the Dunlin, the first feathers are those of summer plumage. In comparing the young in down and halfgrown birds of the Dunlin with those of the Little Stint, we noted that the legs of the young Dunlin in down were pale brown, whilst those of the halfgrown and mature birds were nearly black; the Little Stint, on the other hand, seems to have nearly black legs and feet at all ages.

The Little Stint is evidently much more nearly allied to the Dunlin than to Temminck's Stint, and ought to be called the Little Dunlin. The birds are very similar in colour. The eggs of the Little Stint can hardly be mistaken for those of Temminck's Stint, but are in every respect miniature Dunlin's eggs. The young in down of Temminck's Stint are quite grey compared with the reddish brown of the young of the Dunlin. The young in down of the Little Stint are still redder, especially on the sides and the back of the neck. On the 27th of July Harvie-Brown walked over to the other side of the little inland sea, and found two more nests of the Little Stint, each containing four eggs. These nests were on different ground. They were not on the tundra properly so called, but on the feeding-ground, flat land covered with sand, upon which short grass and bunches of a thick-leaved yellow-flowered plant were growing, abounding also with little lakes and pools. The real tundra is about 150 yards from the water's edge in this place; and the feeding-ground lies between, scattered over with drift-wood of all sorts. The behaviour of the birds at these two nests was exactly the same as at the previous ones.

In the following year Dr. Finsch obtained a nest with four eggs on the Yalmal peninsula which are said to be those of the Little Stint; but as he afterwards asserts that some of the birds mentioned were incorrectly identified, no reliance can be placed on this statement. Henke assured me that he had taken its nest near Archangel ('Ibis,' 1882, p. 381). My friend Mr. Edward Rae took a nest on the Kola peninsula, the eggs of which appear to be those of the Little Stint. In 1880 my friend Collett obtained a nest and eggs of the Little Stint near Kistrand in the Porsanger Fjord, in the extreme north of Norway, a locality where both of us searched in vain for it six years before. In the valley of the Yenesay, in 1877, I obtained eggs which are unmistakably those of the Little Stint, of which I shot several examples in lat. 71½°. East of the valley of the Yenesay the Little Stint was found breeding by Middendorff on the Taimur peninsula, forty years ago. This is probably the eastern limit of its breeding-range*.

* Taczanowski includes the Little Stint in his Birds of Kamtschatka ('Bull. Soc. Zool. France,' 1882, p. 397) on the faith of a single skin of a bird in first plumage, which was in all probability a young example of *T. minuta ruficollis*, a common bird in Japan on migration.

The eggs of the Little Stint vary in ground-colour from pale greenish grey to pale brown, spotted and blotched with rich brown, and with underlying markings of greyer brown and pinkish grey. Sometimes a few very dark brown streaks occur on the large end. The spots and blotches are generally large and often confluent on the large end of the egg. They vary in length from 1·15 to 1·06 inch and in breadth from ·85 to ·8 inch. The eggs of the Little Stint probably go through every variety to which those of the Dunlin are subject. All the eggs we found in the valley of the Petchora were very much incubated, with the exception of one which was probably barren.

The sexes of the Little Stint cannot be distinguished, except by dissection, at any age or season. The general colour of the upper parts of the adult in breeding-plumage is blackish brown, each feather margined with chestnut. On the rump and upper tail-coverts these margins are very obscure; nearly all the wing-coverts, and generally one or two of the innermost secondaries, remain in the plain greyish-brown winter plumage, not having been moulted in spring. The two centre tail-feathers are blackish brown with narrow chestnut margins, the remaining tail-feathers being plain grey; the quills are brown, and a white bar across the wings is produced by the greater coverts having white tips. The whole of the underparts is white, suffused with buff on the breast, which is also spotted with brown. Bill, legs, feet, and claws black; irides hazel. After the autumn moult the general colour of the upper parts is greyish brown, each feather with an obscure dark centre; the underparts are pure white, slightly suffused with grey on the sides of the breast. In this plumage the Little Stint cannot be distinguished from the Red-necked Stint in winter plumage. Young in first plumage differ from adults in summer plumage in having all the wing-coverts, except the greater ones, margined with chestnut, in having many of the chestnut margins of the scapulars replaced by white, and in having the breast, although suffused with buff, without the brown spots. Birds of the year differ from adults in winter plumage in having chestnut margins to the wing-coverts and the two centre tail-feathers. After the first spring moult * the white margins of the scapulars are even more conspicuous than in young in first plumage, and the margins of many of the other feathers are mixed with white; the chestnut margins of the innermost secondaries and centre tail-feathers are also very broad and rich, but the underparts are coloured as in the adult in summer plumage. Young in down resemble those of the Dunlin, but the legs are darker and the general colour is richer.

* An example of the Little Stint collected by Dr. Emin Bey at Lado in Central Africa, on the 16th of February, is moulting its primaries, but is otherwise in full adult winter plumage.

TRINGA MINUTILLA.

AMERICAN STINT.

(Plate 31.)

Tringa minutilla, *Vieill. N. Dict. d'Hist. Nat.* xxxiv. p. 452 (1819); **et auctorum plurimorum**—*Coues, Baird, Ridgway, Dresser, Saunders,* &c.
Tringa wilsoni, *Nutt. Man. Orn.* ii. p. 121 (1834).
Pelidna nana, *Licht. Nomencl. Av.* p. 92 (1854).
Actodromus minutilla (*Vieill.*), Actodromus wilsoni (*Nutt.*), *Bonap. Compt. Rend.* xliii. p. 596 (1856).
Tringa pusilla, *Linn., apud Wilson, Audubon, Bonaparte, Swainson & Richardson, Gray,* &c.

Only two examples of the American form of the Little Stint are known to have been obtained in this country, but it is very probable that it has been overlooked. The first of these little strangers was procured in Mounts Bay, Cornwall, on the 10th of October, 1853; it was shot and preserved by Mr. W. H. Vingoe; it was observed by itself on a piece of wet grass-land near the sea, and when flushed it uttered no sound. These particulars, with a minute description of the bird, furnished to him by its captor, were recorded by Mr. E. H. Rodd ('Zoologist,' 1854, p. 4296).

The second example was shot by Mr. M. Rickards on the 22nd of September, 1869, on a salt-marsh near Bideford, lying between Northam Burrow and the estuary of the rivers Taw and Torridge in Devonshire; this bird was also alone (Rodd, 'Zoologist,' 1869, p. 1920). Further particulars of its capture were contributed, at Mr. Rodd's request, by the gentleman who shot it (Rickards, 'Zoologist,' 1870, p. 2025). It was very active and restless and difficult to approach. When flushed it uttered a short hurried note, and its flight was very strong and rapid. It always flew across the water, when disturbed, at a great height, but invariably returned to the same place. It was a male.

The American form of the Little Stint breeds in the Arctic regions of the western hemisphere from Alaska to Labrador. It passes through the United States and the Bermudas on migration, a few remaining to winter in the Southern States, but the greater number passing southwards to winter in Mexico, the West Indies, Central America, and the northern portions of South America.

This bird is very common in America, frequenting the coasts as well as the interior of the United States on migration to and from its breeding-grounds far away on the tundras of the Arctic regions. Its

northern migration commences in April, and slowly the little birds drift up the coasts, reaching the middle districts of New England early in May, but in North Carolina lingering to the end of the latter month. Their breeding-grounds are reached by the time the snow has melted, and the sun has called into life the millions of insects on which the Stint feeds. When on migration or in their winter-quarters the haunts they prefer are the lowlying coasts. They do not seem to be fond of the sand, but always prefer the black slimy mud, either in the wide marshes near the actual beach, or the low banks of stagnant ponds and rivers. In these situations they often congregate in extensive flocks, but just as frequently one or two may be flushed here and there from the muds. As they rise they utter a loud shrill note, resembling the syllable *wick*; and their flight is performed quickly, but in a very erratic manner, the bird turning and twisting from side to side in its impetuous course. They are very tame, and with the smallest amount of caution may be closely approached. It is a pretty sight to watch a large flock of these little Waders on the mud-flats busy in search of food; they are ever in motion, tripping lightly over the yielding, treacherous surface, picking here and there or probing the mud with their bills. When alarmed the entire flock will rise simultaneously as if by a common impulse, and often wheel and gyrate in the air, now turning their backs, anon their glittering white breasts to the observer as they manœuvre before alighting again. It is a very restless little creature, constantly changing its ground, and even when feeding seems full of nervous activity.

The food of the American Stint is composed of small worms, insects, and larvæ, and all kinds of small soft-bodied animals inhabiting the mud, which the bird is incessantly probing. They are also said to feed on the seeds of aquatic and marine plants, and probably various wild fruits are eaten during the summer. A little gravel is swallowed to aid digestion.

I made the acquaintance of the American Stint last autumn, undertaking a long journey on purpose to interview a large party of Sandpipers resting on migration from their northern breeding-grounds to their southern winter-quarters. Two hundred and fifty miles below Washington, where the Potomac runs into the Atlantic, the shore is interrupted with little creeks, running far inland among the pines, and widening out into lakes hidden by the forests. These chains of lakes and river are full of water at high tide, but at low water are long stretches of half dried-up mud, with a narrow stream winding through them, into which the fishes are condensed in such a compact mass that the water seems alive with them. These creeks are the favourite resort of large flocks of Sandpipers, who stay there a few days to rest and feed in the middle of their migrations. Mr. Beckham was kind enough to pilot me down from Washington to one of these charming creeks. It was during the first week of September, almost in

the middle of the migration season. On the sandy beach of the Atlantic not a bird was to be seen, except now and then a stray Forster's Tern from Cobb's Island. The sand evidently had no charm for the Sandpipers I was in search of. They do not deserve their name; these little *Tringæ* are not so much Sandpipers as mud-larks. We tried to make a short cut to the creek through the forest; but our short cut proved a long round, though we were amply repaid for our labour by the abundance of bird life. Turkey-Buzzards were very common, sometimes perched on the bare branches of an old pine, but more often soaring in majestic grandeur, scarcely deigning to move a pinion. Ospreys were quite as abundant, and the forest was full of small birds. We heard them on every side, from the harsh cry of the Great Belted Kingfisher to the melodious warble of a *Mimus* of some kind. Great Blue Herons as large as Cranes were to be seen standing in the water, and a flock of Little Egrets enlivened the scene. When the tide was down, the creek was almost dry, and wide stretches of mud spread out in various directions. Here the Sandpipers swarmed. They were very gregarious and also social. The commonest species was the Semipalmated Sandpiper, a bird scarcely to be distinguished from the Little Stint. Amongst these birds were a few with longer bills, which are said to be the eastern form, and also a few American Stints. These three species kept together very closely like Dunlins, their wings often flashing in the sun as they wheeled round in concert, as if moved by one impulse. Among them were occasionally to be seen a few Semipalmated Plovers; but these latter birds kept in a small flock to themselves, often wandering on the sand, as did also the Killdeer Plovers, though there were very few of them. One solitary bird preferred a pool in a corner of the creek, and proved, after I shot it, to be a Solitary Sandpiper.

The breeding-season of the American Stint is in June, and the eggs are generally laid during the last ten days of that month, or the first week of July. It breeds abundantly on the tundras, up to the shores of the Arctic Ocean, also on fog-encircled Labrador, where Dr. Coues observed it in considerable numbers. Audubon found the nest of this bird in Labrador, amongst the moss-covered rocks near the shore. The nest is slight, and consists of a little depression, either scratched out by the birds or one selected for the purpose ready-made, scantily lined with a few dead leaves and bits of dry grass. Usually the nest is made close to the margin of a small lake or pool, more rarely near the coast; it is often sheltered by a little bush, or sometimes by a large stone. The eggs are always four in number when the full complement is laid. In ground-colour they are dull buff, spotted and blotched with reddish brown, and with paler and somewhat indistinct underlying markings. Most of the spots are congregated on the large end of the egg, often becoming confluent. They are

very handsome eggs, scarcely to be distinguished from those of the Little Stint, and except in size from those of the Dunlin; sometimes the ground-colour is almost concealed by the spots, causing the eggs to resemble those of the Broad-billed Sandpiper. They vary in length from 1·15 to ·95 inch, and in breadth from ·85 to ·75 inch. When alarmed at the nest the sitting bird often performs various alluring antics to decoy the intruder from its treasure. If not much disturbed, the parent is said soon to return to its charge, but to become very wary if fired at. Only one brood is reared in the year, and as soon as the young are fledged the little birds seem anxious to return south again before the tempests sweep over the Arctic wilds.

By the middle of July the American Stints begin to appear in their wonted autumnal haunts in the States; as August approaches their number increases, but the main flocks do not arrive before September. In autumn and winter they often congregate with other Waders, frequenting the mud-flats, weed-covered rocks, masses of drifting seaweed, or the sandy shore strewn with all kinds of marine refuse. The flesh of this bird is said to be excellent.

The American Stint exactly resembles the Little Stint in all its changes of plumage, and can scarcely be regarded as more than a local race of that bird. A series of birds from the New World can always be distinguished from a series from the Old World; but if the smallest, blackest, and least chestnut birds be selected from the Old-World series, and mixed with the largest, least black, and most chestnut examples from the New-World series, it would be impossible to separate them. The differentiation between the two forms is probably not yet complete, and possibly it is prevented from becoming so by their habitual interbreeding on the shores of the Behring Sea and the occasional emigration of American birds to Western Europe. The American Stint varies in length of wing from 3·3 to 3·6 inch, whilst the Little Stint varies from 3·6 to 4·0 inch. Typical examples of the American form have slightly paler legs, a somewhat more spotted breast, and the black centres of the feathers of the upper parts are slightly more developed, whilst their chestnut margins are narrower. These are very slight characters, and only apply to typical examples, the range of individual variation entirely covering the difference between the two forms.

TRINGA TEMMINCKI.

TEMMINCK'S STINT.

(Plate 31.)

Tringa temminckii, *Leisler, Nachtr. Bechst. Naturg. Deutschl.* ii. p. 78 (1812); **et auctorum plurimorum** — *Temminck, Naumann, Jerdon, Swinhoe, Dresser, Saunders,* &c.

Pelidna temminckii (*Leisl.*), *Boie, Isis,* 1826, p. 979.

Leimonites temminckii (*Leisl.*), *Kaup, Natürl. Syst.* p. 37 (1829).

Schæniclus temminckii (*Leisl.*), *Gray, List Birds Brit. Mus.* iii. p. 106 (1844).

Actodromas temminckii (*Leisl.*), *Salvad. Ucc. Born.* p. 324 (1874).

Temminck's Stint is a regular but by no means common visitor to the east and south coasts of England on spring and autumn migration. In the former season it passes through in May, and in the latter returns in September, occasionally lingering as late as November. Gray says that it has once occurred in Scotland, in Caithness, and Thompson records a single example from Ireland; it has also been occasionally obtained in a few inland localities in England.

Temminck's Stint is essentially an Arctic bird, breeding in the Old-World portion of the Circumpolar Region on the tundras above the limit of forest-growth, and in similar localities on the banks of the great rivers as far south as lat. 65° on the shores of the White Sea and the Gulf of Bothnia, and as far south as lat. 55° on the shores of the Sea of Ochotsk .It is also recorded as breeding above the limit of forest-growth on the Pamir and the mountains of Dauria; but the evidence in support of these statements is very unsatisfactory. It has not been recorded from Kamtschatka, nor has it ever been observed in Japan; but it was obtained by the 'Vega' expedition in Tchuski Land. On migration it passes not only along the coasts of Europe and China, but also along most of the inland lines of migration, to its winter-quarters in the basin of the Mediterranean and North Africa, India and Ceylon, Burma, South China, Borneo and probably other islands of the Malay archipelago. Temminck's Stint has no very near ally. Though it somewhat resembles the Little Stint and its allies in winter plumage, it may at once be distinguished from any of them by the colour of the tail-feathers.

Although Temminck's Stint breeds further south and further west than the Little Stint, it is, curiously enough, much less common on our shores than the latter species. The explanation probably is that it is much less exclusively a marine bird than its more showy ally. Although it is often seen on the sandy shores of large rivers and lakes, it prefers mud-flats to

sand-banks, and on the coast it leaves the sandy sea-shore to feed on the fields of mud left by the receding tide in the estuaries of rivers. It consequently migrates to and from its breeding-grounds for the most part across country, following the river-valleys, instead of crossing the ocean or "hugging the coast," as the Little Stint appears to do. Neither in the valley of the Petchora nor in that of the Yenesay did I see any thing of the Little Stint on migration; but Temminck's Stint arrived at Ust Zylma on the 26th of May, and at the Koorayika on the 6th of June.

I first made the acquaintance of Temminck's Stint at Tromso, on the west coast of Finmark, where it was very common. These charming little birds were in full song in the middle of June. It was a most interesting sight to watch them flying up into the air, wheeling round and round, singing almost as vigorously and nearly as melodiously as a Sky-Lark. Sometimes they were to be seen perched on a rail or a post, or even on the slender branch of a willow, vibrating their little wings like a Wood-Wren, and trilling with all their might; and often the song was uttered on the ground as they ran along the short grass with wings elevated over the back. The song of this bird is not unlike that of the Grasshopper Warbler, but is louder and shriller. Its usual call-note is a spluttering but very distinct *pt-r-r-r*.

On the wing Temminck's Stint looks like a small Dunlin, but it does not congregate in such large flocks. At its breeding-grounds it is only seen in pairs; but on migration small parties may be seen, sometimes alone, but often in the company of other Sandpipers. It can fly almost as quickly as a Swallow, and the flocks wheel round, now spreading out, then bunching together like Starlings, but in all their gyrations moving as if actuated by one impulse. When alone they are tame enough, and allow of a near approach; but when in the company of larger and wilder Sandpipers they learn caution from their more wary companions.

Its food consists of small insects and worms; and fragments of quartz and vegetable substances have been found in its stomach.

It can scarcely be said to breed in colonies, but I have frequently found several nests within a few yards of each other. They are mere depressions in the ground, lined with a little dry grass, and are seldom far from water. They are not difficult to find, the sitting bird (which, according to Collett, is generally the male) betraying its treasures by its peculiar flight. When the nest is discovered, like the Little Stint, the bird appears to assume an unnatural tameness, walking about and feeding close to the observer. The nest is often in longish sedge or rushes, and less frequently in short grass.

The eggs of Temminck's Stint are four in number, and vary in ground-colour from pale buff to pale olive and pale greyish green; they are spotted and blotched with reddish brown and dark brown, and with under-

lying markings of pale brown and purplish grey. The markings are largest and most numerous on the large end of the egg, where they are often confluent and form an irregular zone or a large irregular mass. On many eggs there are a few dark streaks on the large end; and the small spots are generally distributed almost evenly over the entire surface. The eggs vary in length from 1·2 to 1·05 inch, and in breadth from ·87 to ·8 inch. It is impossible to give any characters by which the eggs of Temminck's Stint may always be distinguished from those of the Little Stint. As a rule, the eggs of the latter bird are more buff in ground-colour, and the markings are larger, bolder, and a richer brown. Temminck's Stint only rears one brood in the year.

There is no difference in the colour of the sexes of Temminck's Stint. The adult summer plumage varies greatly in individuals, having the appearance of never being quite perfectly assumed. The general colour of the upper parts is greyish brown, many of the feathers, sometimes more and sometimes fewer, being dark brown, margined and irregularly barred with buffish chestnut; the four centre tail-feathers are dark brown, and the three outer ones on each side are white; the quills are brown, the first only with a white shaft, and a white bar is formed across the wing by the greater coverts having white tips. In the colour of the underparts it does not differ from the Little Stint. Bill brownish black; legs, feet, and claws brownish grey; irides hazel. After the autumn moult no change takes place in the colour of the underparts, except that the streaks are absent from the breast, but the upper parts are uniform brownish grey, with very obscure dark centres and pale margins to the feathers. Young in first plumage resemble adults in winter plumage, but each feather of the upper parts has a buff margin, which is emphasized by a narrow submarginal dark brown band; the underparts are white, suffused with buff on the flanks and breast, the latter of which is also streaked with brown. Birds of the year only differ from adults in winter plumage by having buff margins to the wing-coverts. After the first spring moult the buff margins to the feathers of the upper parts are more conspicuous than they are in the greater number of the adults in summer plumage. Young in down closely resemble those of the Dunlin and Little Stint, but are much greyer in ground-colour.

Genus CALIDRIS.

Linnæus appears to have been unaware that the Sanderling was a Swedish bird; but he includes it twice over as a European species—once under the genus *Tringa*, and a second time under the genus *Charadrius*, in each case the diagnosis clearly referring to the Sanderling in winter plumage. In both cases Brisson's plate is referred to. In 1800 Cuvier published a chart in the first volume of his 'Leçons d'Anatomie comparée,' in which he is supposed to have treated the Sanderling as generically distinct from the other Sandpipers under the name of *Calidris*; and in 1811 Illiger, in his 'Prodromus Systematis Mammalium et Avium,' formally established the genus and described its characters, making the Sanderling (the *Charadrius calidris* of Linnæus) the type. In the meantime, however, in 1803, Bechstein, in his 'Ornithologisches Taschenbuch,' had made the Sanderling the type of a genus *Arenaria*, founded upon the *Tringa arenaria* of Linnæus; but this genus may be rejected on the ground that the name had not only been applied by Brisson to the Turnstones, but also by Linnæus to a genus of plants.

The fact that the Sanderling is the only Sandpiper which has no hind toe makes the diagnosis of the genus *Calidris* very simple. It forms another connecting link between the closely allied genera *Totanus* and *Tringa*, having the hard bill of the former and the cleft toes of the latter. It also agrees with the latter genus in having no bars on the tail and in having short legs.

The genus *Calidris* only contains one species, which is a circumpolar bird during the breeding-season, migrating southwards to winter.

In its habits, food, &c. it resembles very closely the species in the nearly allied genera.

CALIDRIS ARENARIA.

SANDERLING.

(Plate 27.)

Tringa calidris grisea minor, *Briss. Orn.* v. p. 236, pl. xx. fig. 2 (1760).
Tringa arenaria, *Linn. Syst. Nat.* i. p. 251 (1766); **et auctorum plurimorum**—(*Naumann*), (*Temminck*), (*Dresser*), (*Saunders*), &c.
Charadrius calidris, *Linn. Syst. Nat.* i. p. 255 (1766).
Charadrius rubidus, *Gmel. Syst. Nat.* i. p. 688 (1788).
Arenaria vulgaris, *Bechst. Orn. Taschenb.* p. 462 *a*, pl. 39 (1803).
Arenaria grisea, *Bechst. Naturg. Deutschl.* iii. p. 368 (1809).
Arenaria calidris (*Linn.*), *Meyer, Taschenb.* ii. p. 326 (1810).
Calidris arenaria (*Linn.*), *Illig. Prodr.* p. 249 (1811).
Calidris rubidus (*Gmel.*), *Vieill. N. Dict. d'Hist. Nat.* xxx. p. 127 (1819).
Calidris tringoides, *Vieill. Gal. des Ois.* iii. p. 95, pl. 234 (1825).
Trynga tridactyla, *Pall. Zoogr. Rosso-Asiat.* ii. p. 198 (1826).

The Sanderling visits all suitable portions of the coasts of the British Islands in autumn and in spring, on its way to and from its northern breeding-grounds. Most of the birds that arrive here in autumn only linger a short time and then pass southwards, but a few remain over the winter in many districts, especially on the south and east coasts. It also visits the adjoining islands, as well as the mainland, being well known in the Orkney and Shetland Islands, the Hebrides, and the Channel Islands.

The Sanderling is a circumpolar bird, and doubtless breeds on all the coasts of the Arctic Ocean, though its eggs have only been taken on the Anderson River (lat. 68°), in Grinnell Land (lat. 82½°), Greenland, Sabine Island (lat. 74½°), and in Iceland (lat. 65°). On the Asiatic coast I have shot it myself in July in lat. 69°, Middendorff observed it on the Taimur peninsula in lat. 74°, and it is a common bird in summer in Alaska. Its lines of migration are not only along the coasts of Europe, Asia, and America, but also across country, as it occurs in some numbers in spring and autumn on the Volga, the Kama, and at Lake Baikal. Its winter range is very extensive, including the basin of the Mediterranean and the rest of the coasts of Africa and the adjoining islands. It is particularly common on the Mekran caast, but very rare in India, Ceylon, and Burma. It is a winter visitor to China, Japan, and the islands of the Malay archipelago, the whole of the coasts of South America, the West Indies, and the Bermudas. It is not known that throughout this extensive area of distribution it is subject to any local variation—doubtless in consequence of the limited area of its breeding-range, which, though circumpolar, is very contracted in consequence of its being so far north. The Sanderling has no very near

ally; but in the changes of its plumage, which probably point out its true affinities, it bears a close resemblance to the Broad-billed Sandpiper and the Little Stint.

The Sanderling begins to leave its winter-quarters in the extreme south early in April, but a few linger near Gibraltar and other parts of South Europe until the beginning of May. It makes its appearance on the British coasts in April, as it also does on the coasts of Northern France and Holland, where it lingers until the end of May. A few non-breeding birds sometimes remain all the summer in their winter-quarters. The Sanderling is one of the first birds to reach its breeding-grounds in the Arctic regions. Captain Feilden first observed it in Grinnell Land on the 5th of June, flying in company with Knots and Turnstones; whilst Middendorff states that it arrived on the Taimur peninsula (in lat. 74°) on the 4th of June. The return migration begins very early, as soon as the young are able to fly sufficiently well to bear the fatigues of their long journey south to their winter-quarters. They begin to arrive on the British coasts early in August, a few stray birds often appearing during the end of July, and from that date to September they continue to come. By the middle of September most of the birds have hurried away further south, but a few always remain on our coasts during the entire winter. On the coasts of Holland and Northern France they appear in August and September, many lingering until October and early in November before passing south. Sanderlings are said to migrate by night in small flocks, and sometimes in company with other wading birds that breed in the high Arctic regions. It is often caught in the flight-nets at night on the Lincolnshire coast, and is especially common on Heligoland. Its migrations in the New World are very similar and at the same dates.

The Sanderling is a thorough shore-bird, and the instances of its occurrence far from the coast are very exceptional. It loves the low sandy beach, which at low water provides it a suitable feeding-ground, the extensive tracts on the east coasts of England being eminently suited to it. On the mud-flats it does not appear to be as numerous as on the sand, showing in this respect a closer affinity to the small Plovers than to the Sandpipers. During its sojourn in this country it is more or less gregarious, often congregating in large flocks, and very often a few odd birds consorting with a flock of Dunlins or Knots. It is by no means shy, especially just after its appearance here in autumn, but incessant persecution soon teaches it wariness. As soon as the tide recedes the Sanderling is as active as any bird on the coast, running lightly to and fro, pattering across the shining sands, wading through the little pools, or tripping along just out of reach of the waves. Its brilliant white breast makes it a very conspicuous object, and as a flock of these birds stand dotted here and there on the sand they often bear a close resemblance to

large white pebbles, bits of paper, or flecks of foam. As you approach nearer, these white objects begin to move, running along before you and taking care to keep just out of gunshot, feeding all the time in the most unconcerned manner. If flushed they usually fly out to sea, and pass along the coast just above the water for a hundred yards or so, and then again come inshore and alight on the sands. They are very active little birds and seem ever bent on searching the coast most minutely for their food. When running to and fro they often unfold their wings and elevate them above their backs for a moment. Should a bird be wounded it will take to the water and float buoyantly, and it is said that they will even dive; but such modes of progression are never indulged in under ordinary circumstances. Sometimes when a flock of these birds is disturbed they will rise and wheel and turn in the air.

The food of the Sanderling during its stay in this country consists principally of small crustaceans, sand-worms, small beetles, and insects; its stomach also generally contains a small quantity of coarse sand, and sometimes little pieces of seaweed. In summer the Sanderling is probably more insectivorous; but, like the Knot, it was observed by Captain Feilden in Grinnell Land to feed on the buds of the saxifrage. The note of the Sanderling is a clear sharp *wick*.

Of the habits of the Sanderling during the breeding-season we know little. It possibly pairs before it leaves its winter-quarters; for it has been observed in chase of its mate on the sands. It arrives at its breeding-place as soon as the snow is sufficiently melted to allow it to find food, and shortly after its arrival nesting-duties are commenced. Probably the first authentic eggs of the Sanderling were obtained by MacFarlane on the Barren Grounds, close to the shore of the Arctic Ocean, a little east of the Anderson River, in North-west America. He found the nest on the 29th of June, 1863; it contained four fresh eggs, and the female was captured. The nest was slight, made of a little dry grass and leaves. In 1876 Captain Feilden added further to our knowledge concerning this interesting little bird. He found it breeding at the extreme northern limit of animal life on the shores of the Frozen Ocean, a little to the west of Cape Union, in Grinnell Land. He observed several pairs of birds, and found one nest, containing two eggs, on the 24th of June. It was placed on a gravel ridge, several hundred feet above sea-level, and consisted merely of a slight depression in the centre of a recumbent plant of willow, lined with a few dead leaves and last year's catkins. At this nest the male was killed; so that it appears that both parents assist in incubating the eggs. On the 8th of August of the same year he observed several parties of young Sanderlings just able to fly, and with down still sticking to their feathers, being led about by their parents and searching diligently for insects.

The eggs of the Sanderling are four in number, buffish olive in ground-

colour, thickly mottled and spotted with pale olive-brown and with a few indistinct underlying markings of violet-grey. The eggs obtained by MacFarlane, as well as one in my own collection from Iceland, have most of the markings on the large end; but those obtained by Captain Feilden have them more uniformly dispersed over the entire surface. (The latter eggs are figured in the "Appendix" to Nares's 'Voyage to the Polar Sea,' ii. p. 210, pl. 1.) They vary in length from 1·44 to 1·35 inch, and in breadth from ·99 to ·93 inch. It is not easy to confuse the eggs of any other British bird with those of the Sanderling.

Only one brood appears to be reared in the year; and as soon as the young are strong on the wing the short Arctic summer is already on the wane, and the birds depart south again, accompanied by their young. The journey south must be performed with as much despatch as the journey in spring; for the young arrive on our coasts with down still adhering to their plumage, and the old birds have not lost their brilliant nuptial dress.

It is not known that there is any difference in the colour of the plumage of the sexes in the Sanderling. In the adult in breeding-plumage the general colour of the upper parts is brownish black, most of the feathers having buffish-chestnut edges, some of them barred with chestnut and many tipped with white; the wings are brown. A white bar across the wing is conspicuous during flight, formed by the white tips of the greater wing-coverts and the white bases of the secondaries, some of the innermost of which are entirely white, exactly resembling the Dunlin in these particulars. The wing-coverts of the winter plumage are retained during summer. The two centre tail-feathers are dark brown; the remainder are brownish grey. The whole of the underparts are pure white, except the neck, throat, and upper breast, which are buff, spotted and streaked with brownish black. Bill, legs, feet, and claws black; irides hazel. After the autumn moult the general colour of the upper parts is grey, each feather with a dark shaft-streak and an obscure pale margin; both features are most developed on the wing-coverts, rump, and upper tail-coverts. The forehead, eye-stripe, and the whole of the underparts are pure white. Young in first plumage differ from adults in breeding-plumage in having the chestnut replaced by buffish white, which soon fades into white, leaving the plumage nearly black, spotted and barred with pure white; the underparts are suffused with buff, which soon fades into white. Birds of the year differ from adults in winter plumage in having the innermost secondaries and wing-coverts nearly black, spotted and margined with white, as in young in first plumage. Young in down of the Sanderling are at present unknown.

Genus TRYNGITES.

The genus *Trynyites* was established by Cabanis in 1856, in the 'Journal für Ornithologie,' iv. p. 418, for the reception of the Buff-breasted Sandpiper, *Tryngites rufescens*, which he made the type.

It forms another link between the closely allied genera *Tringa* and *Totanus*, having, like the Sanderling, the hard bill of the latter and the cleft toes of the former. It differs from the Sanderling, not only in having a hind toe, but also in the changes of plumage which it undergoes. In this respect, as well as in many of its habits, it resembles the Snipes.

Only one species is known, which breeds in the Nearctic Region and winters in the Neotropical Region, occasionally straying to Europe on migration.

TRYNGITES RUFESCENS.

BUFF-BREASTED SANDPIPER.

(Plate 31.)

Tringa subruficollis, *Vieill. N. Dict. d'Hist. Nat.* xxxiv. p. 465 (1819).
Tringa rufescens, *Vieill. N. Dict. d'Hist. Nat.* xxxiv. p. 470 (1819); **et auctorum plurimorum**—*Nuttall, Audubon, (Cassin), (Baird), (Coues), (Ridgway), (Saunders)*, &c.
Actitis rufescens (*Vieill.*), *Schlegel, Rev. Crit.* p. 92 (1844).
Actiturus rufescens (*Vieill.*), *Bonap. Rev. Crit.* p. 186 (1850).
Tringoides rufescens (*Vieill.*), *Gray, Cat. Brit. B.* p. 178 (1850).
Limicola brevirostris, *Licht. Nomencl. Av.* p. 92 (1854).
Actidurus nævius, *Heermann, Proc. Phil. Acad.* vii. p. 179 (1854).
Tryngites rufescens (*Vieill.*), *Cab. Journ. Orn.* 1856, p. 418.

The first record of the occurrence of the Buff-breasted Sandpiper in the British Islands is that of an example which was shot early in September 1826, in the parish of Melbourne, Cambridgeshire. It was in the company of a party of Dotterel (Yarrell, Trans. Linn. Soc. xvi. p. 109, pl. 11). Since that date eleven examples have been obtained and recorded at different times in England, three have been procured in Ireland, and one in Scotland. Most of these birds have been captured in autumn, but one was killed in May.

The Buff-breasted Sandpiper may be regarded as a summer visitor to the Arctic regions of America, although it has not been recorded from Greenland. From Alaska its range extends to the Siberian coasts of Behring's Straits; and Middendorff obtained a single example on the southern shores of the Sea of Ochotsk. It passes through the United States on migration, to winter in the West Indies, Mexico, and the northern portions of South America, and has occurred on the Bermudas and on Heligoland.

In many of its habits the Buff-breasted Sandpiper resembles Bartram's Sandpiper. Like that bird, in passing through the United States of America on its way to and from its breeding-grounds in the Arctic regions it chooses as its principal line of migration the vast interior prairies. It does not seem to be a very shy bird, and loves to frequent grassy wastes, either near the coast or far in the interior. Like Bartram's Sandpiper, this bird does not frequent so much the margins of rivers and lakes as the grassy tracts, and is fond of running about the wide waggon-tracks of the prairie which serve as roads. Sometimes it may be seen on places that are almost bare of vegetation, where it runs about in a

manner very similar to that of a Plover. Its flight is moderately quick, and is performed with regular beats of the wings. Dr. Heermann describes its note as a low *tweet*, several times repeated. This note is generally heard as the bird rises on the wing, and less frequently as it runs over the ground. The Buff-breasted Sandpiper is very tame, and when fired at seldom flies far, even if its companions fall, merely contenting itself with making a short detour and then returning almost to the same spot.

The food of the Buff-breasted Sandpiper is principally composed of insects, especially beetles and grasshoppers, for which it searches amongst the herbage and the droppings of cattle. It also feeds on worms and small marine animals, such as crustaceans, mollusks, &c. To this fare may perhaps be added small fruits and berries.

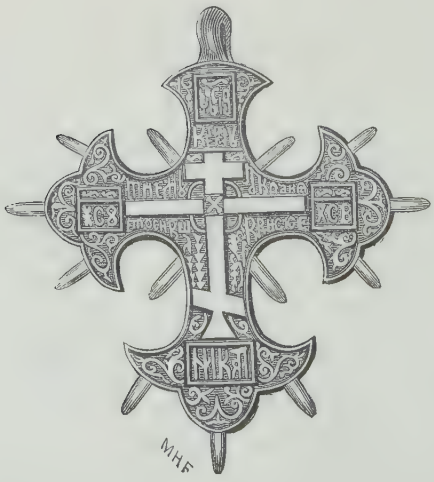
But little is known of the life-history of the Buff-breasted Sandpiper, and only the scantiest particulars are known respecting its nest and its habits during the breeding-season. It spends the summer in the Arctic regions, and was found breeding abundantly on the Anderson river by MacFarlane. The nest, he says, is always on the ground, and is scarcely distinguishable from that of the Golden Plover: it must consequently be very slight, little more than a depression, scantily lined with a few dead leaves and bits of dry grass. All the nests that MacFarlane obtained were on the tundras lying between Horton river and the coast. The nests were obtained between the 26th of June and the 9th of July. When the full clutch is laid, the eggs appear always to be four in number.

The eggs of the Buff-breasted Sandpiper, of which I have examined the magnificent series in the Museum of the Smithsonian Institution at Washington, are about as large as those of the Wood-Sandpiper, but in colour they rival those of the Redshank. The only adjective that an ornithologist can apply to them is "superb." They vary in ground-colour from pale sandy to rich ochre, sometimes with a slight olive tint. The overlying spots are a very rich reddish brown, varying somewhat in intensity, most of them very bold irregular blotches, often confluent round the large end of the egg, varied with smaller spots. The underlying markings are numerous, well defined, and pale lavender in colour. In some eggs the spots are smaller, whilst in others they take the form of diagonal dashes. Often the large ends are slightly streaked with dark brown. They vary in length from 1·5 to 1·4 inch, and in breadth from 1·1 to 1·02 inch. At the nest the sitting bird appears to be very tame, flying away for a short distance, and then waiting to watch the fate of its treasure. Probably only one brood is reared in the year, as the season is not sufficiently long to allow for a second.

In their journey southwards the Buff-breasted Sandpipers fly in little parties or small flocks, and at that season are seen on the sea-shore. Of their habits in winter nothing appears to have been recorded; but as the

winter plumage scarcely differs from that of summer, there can be little doubt that, like the Snipes, it does not frequent the exposed mud-flats or sand-banks, and has no necessity to assume a grey dress for protection.

The Buff-breasted Sandpiper is a miniature Bartram's Sandpiper, having the same graduated tail and the same marbled primaries. It is not known that the sexes differ externally. The general colour of both the upper and under parts is dark buff, the feathers of the former having black centres and those of the latter pale margins. The peculiarity in the plumage of this unique bird consists in the colour of the tail-feathers (with the exception of the two centre ones), the primaries, secondaries, lowest under wing-coverts, greater wing-coverts, and primary wing-coverts, which are buff marbled with black, broadly tipped with black and narrowly margined with white. Bill and claws dark brown; legs and feet buff; irides hazel. After the autumn moult the pale margins of the feathers of the upper parts are more conspicuous, concealing more of the dark centres. Young in first plumage have the underparts much paler, the marbling on the primaries is much finer, and the margins of the feathers on the mantle and scapulars are white. Birds of the year resemble young in first plumage in having the dark centres of the wing-coverts almost obsolete, whilst they have a subterminal black bar. Young in down are unknown.



Genus SCOLOPAX.

The genus *Scolopax* was recognized by Linnæus in 1766, in the 12th edition of his 'Systema Naturæ,' i. p. 242. The Woodcock, *S. rusticola* (being the *Scolopax scolopax* of Brisson), is the type.

The Snipes have the tarsus scutellated both before and behind; the toes are cleft to the base, and they have a small hind toe. They are further distinguished by their long straight bill, longer than the tarsus and middle toe, and slightly enlarged and softened towards the tip, the soft part appearing hexagonally corrugated when dry and hard.

The genus *Scolopax* is cosmopolitan and contains about a score species, of which four breed in Europe. Two of these breed in the British Islands, and the other two visit us in spring and autumn.

The genus *Scolopax* has fared no better than the allied genera, and has been divided and subdivided remorselessly by ornithologists anxious to see their names handed down to posterity tied to the tail of a genus.

The wanton multiplication of genera has become an evil of such magnitude, that ornithological nomenclature is rapidly becoming ripe for the introduction of uninomialism. The division of a genus into subgeneric groups is very useful and most scientific; but to substitute the subgeneric name for that of the genus, and thus burden the memory with five or six times as many names as are necessary, is not only useless but productive of great harm, and, so far from being scientific, it violates the first principles of science. Nothing is so difficult as to teach people the extent of their own ignorance. The multiplication of genera is perpetrated under the delusion that certain so-called structural characters are of generic value. If ornithologists would only learn that they are *absolutely ignorant* of the taxonomic value of any generic characters, they would not allow their vanity to tempt them into the folly of genus-making. It is far more important to know what are the nearest relations of a bird, than to be told that in the opinion of some ornithological pedant the characters which isolate it from its fellows are of generic value. No one who has studied the subject dreams that it is possible even to attempt to make the lines which divide genera of the same breadth. The bewildered ornithologist, who has learnt the use of names and the value of classification, in his endeavours to be scientific, must become alternately a "splitter" and a "lumper." When he has to deal with a crowd of closely allied birds, as the Thrushes, he is glad to catch hold of a straw to keep a genus afloat; but when he regards a diversified group, like the Snipes or the Plovers, he is obliged to drown genera by the score, and pelt them with ridicule and abuse until they sink.

To an ornithologist only acquainted with European birds, the Woodcocks appear generically distinct from the Snipes; but the character of the feathered tibia relied upon to distinguish the former from the latter is of no value. Three South-American species of Snipe possess this character, almost in as marked a degree as the true Woodcocks, whilst the Woodcock inhabiting the island of Ternate (an unmistakable Woodcock in colour) has the tibia as bare as in that of a Snipe. The Woodcocks form a fairly distinct subgenus, which may be characterized by the white tips on the under surface of the tail-feathers.

The Snipes frequent marshy places, one or two species showing a preference for wooded districts. They are shy skulking birds, only taking wing when absolutely compelled; but they run and walk with ease. They are for the most part solitary, and never congregate into flocks like the other Waders, although numbers are often flushed from a small plot of ground. They obtain most of their food at dusk, and are most active at nightfall. Their flight is very rapid and well sustained. Their food consists of insects, worms, &c., for which they probe the soft mud with their long bills; but, strange to say, they are never seen on the extensive mud-flats which are frequented in winter by so many species of Sandpipers. In consequence of their spending the whole year in marshes or other localities where the vegetation effectually conceals them from view or harmonizes with their pronounced colours, they do not require to assume a grey dress in winter, as nearly all the Sandpipers which frequent the mud-flats do. Their notes are loud and not unmusical. Their eggs, four in number and pyriform in shape, are laid in a depression in the ground on only a rudimentary nest.

SCOLOPAX RUSTICOLA.

WOODCOCK.

(Plate 28.)

Scolopax scolopax, *Briss. Orn.* v. p. 292 (1760).
Scolopax rusticola, *Linn. Syst. Nat.* i. p. 243 (1766); **et auctorum plurimorum**—*Naumann, Keyserling & Blasius, Schlegel, Gray, Dresser, Saunders*, &c.
Rusticola vulgaris, *Vieill. N. Dict. d'Hist. Nat.* iii. p. 348 (1816).
Rusticola europæa, *Less. Traité d'Orn.* p. 555 (1831).
Scolopax indicus, *Hodgs. Journ. As. Soc. Beng.* ii. pt. 1, p. 490 (1837).
Rusticola sylvestris, *Macgill. Man. Brit. B.* ii. p. 105 (1842).
Scolopax scoparia, *Bonap. Compt. Rend.* xliii. p. 579 (1856).

The Woodcock breeds somewhat sparingly and locally throughout the British Islands, including the Shetlands and some of the Inner Islands, and may constantly be met with during winter; but its numbers are largely increased in autumn and spring by birds principally passing through on migration. At these seasons it is common on the Orkneys and the Outer Hebrides, though, owing to the absence of suitable cover, it does not breed in any of these islands.

The Woodcock is a semi-Arctic bird, ranging from the Atlantic to the Pacific. In Scandinavia it breeds up to the Arctic circle; in West Russia up to about lat. 65°; but in East Russia and Siberia not much further north than lat. 60°. Its southern breeding-range extends to the Azores, the Canaries, and Madeira, to the Alps, the Carpathians, and the Caucasus, to the Himalayas, where it breeds at an elevation of 10,000 feet, and to Mongolia and the mountains of Japan. It winters in enormous numbers in the basin of the Mediterranean and in Persia, India, Ceylon, Burma, and China. It has not occurred in Iceland or Greenland, and only once on the Faroes; but accidental stragglers have been met with on the American continent, in Newfoundland, New Jersey, and Virginia.

In the New World our Woodcock is represented by the American Woodcock (*Scolopax minor*), a much smaller bird, with the three first primaries curiously narrowed, and the underparts nearly uniform buff, without the transverse bars.

Opinions differ as to the fact of the Woodcock being a resident in our islands. Sportsmen and gamekeepers assert that the Woodcocks bred in this country migrate southwards in August, presumably to their winter-quarters in the basin of the Mediterranean, whilst their place is not taken by winter visitors from Scandinavia until the middle of October. This view is supported by the observations of St. John ('Wild Sports &c. of the Highlands,' illustrated edition, p. 266), who states that he could never find

a single bird at their breeding-places in the Highlands in September and the beginning of October, though he repeatedly tried to do so. Precisely the same information was given me by the gamekeepers in Sherwood Forest; but if these alleged facts be true, the Woodcock would be very exceptional in its migrations. This bird is certainly not a gipsy migrant, but has a regular winter home, to which it is very constant in returning year after year. The rule amongst regular migrants is unquestionably that whenever the breeding-range overlaps the winter range, the birds in the overlapping districts are residents, those breeding further north only passing through the intervening district on migration to winter further south. Before the Woodcock can be regarded as exceptional in this respect, it must be proved that the birds bred in this country really leave our shores, and that their apparent absence is not to be explained by their skulking habits during their autumnal moult. A strong argument that they do not migrate is to be found in the fact that it is not an uncommon thing to find eggs of the Woodcock in our islands at the time when the great spring migration to this country is only just beginning.

The Woodcock disappears from its winter-quarters in the basin of the Mediterranean at Gibraltar during the last half of February, and in the Levant during the first half of March. It passes through North Germany and the British Islands during the month of March, and arrives in South Sweden late in March or early in April. It reappears upon our shores during the month of October, the migration often lasting through November, and reaches the basin of the Mediterranean in the east during the last half of October, and in the west during the first half of November. The Woodcock is almost entirely nocturnal in its habits and only migrates at night. It is quite as solitary in its habits as its congeners, migrating across country singly or in pairs, and only appearing to be gregarious whilst crossing the sea, and then only when an accumulation of birds has taken place in consequence of the continuance of unfavourable winds. Under these circumstances flights of Woodcocks have been seen crossing the ocean, but they are said to disperse as soon as the shore is reached, or even when land is in sight.

During the day the Woodcock frequents the outskirts of woods and forests where there is plenty of cover under which it can lie concealed. In the evening it seeks the marshes to feed; but even under the protection of the shades of twilight it is still very cautious in exposing itself to view, and prefers swampy ground either in the forest or in open places abounding with brushwood and rank vegetation. In its winter-quarters in India it is described as avoiding stagnant swamps, and only frequenting those where running water is to be found. When disturbed during the day it rises with a whirring sound, occasionally, but not always, uttering a cry resembling that of the Common Snipe, and which may be represented by

the syllable *skaych*. When fairly on the wing its flight is much slower than that of the Common Snipe; the bill is always pointed considerably downwards, as though it were too heavy to be held out straight; the wings are bent, and the general direction of the flight is straight, but occasionally it is varied with curious twists and turnings. The Woodcock seldom flies far, and as soon as it finds a suitable cover drops suddenly into it, almost as if shot. Immediately on their arrival in this country they sit very close and are very difficult to flush, and may be found concealed under a hedge in a ditch, or even amongst turnips or long dry grass. It is said that on migration they generally fly up-wind at a considerable height, and that they have been seen to alight after an almost perpendicular descent.

The chief food of the Woodcock consists of earth-worms; but small beetles, grasshoppers, grass-seeds, and small vegetable fragments have been found in its stomach. It has also been known to swallow small shell-fish. The Woodcock appears to have certain routes to and from its feeding-grounds; and so regularly does it traverse them, that nets are often spread across its wonted path, in which numbers are caught. It is a very voracious bird, and the quantity of worms it devours is enormous.

Woodcocks have been known to breed in the British Islands from time immemorial; but it has generally been assumed that they do so more often now than formerly. There is no evidence that this is the case. The Woodcock's nest is more often heard of because so much more attention is now paid to ornithology than was the case a hundred years ago.

The Woodcock does not drum like the Snipe; but during the breeding-season, like that bird, the male forgets for a time his skulking habits, and flies backwards and forwards, uttering a peculiar note, which, though unquestionably proceeding from the throat, must be regarded as analogous to the drumming of the Snipe. This peculiar habit of the Woodcock is described as "rôding"*, and is indulged in early in the morning and late in the evening in the pairing-season, sometimes before it reaches its breeding-grounds, but more often after its arrival there. This rôding continues for about a quarter of an hour, during which two peculiar notes are uttered, sometimes singly and sometimes one following the other. One of these is a hollow, deep-sounding, somewhat lengthened note, which Naumann represents as *yurrk*, and Ekström by *orrt*; the other is a high, sharp, short whistle, which the former naturalist represents as *pseep*, and the latter as *pisp*. Should two males chance to meet whilst "rôding," a fight frequently takes place, and they chase each other with great rapidity

* From the French "rôder," to roam, to ramble, to rove, to wander, to walk, or move about from place to place without any certain direction.

amongst the trees and bushes. When rôding, the flight is slow and straight, and the plumage is puffed out, making the bird look very large.

The Woodcock is a very early breeder. St. John had a nest brought to him containing three eggs, taken on the 9th of March in the north of Scotland; and Mr. A. W. Johnson informs me that he has taken a full clutch on the 3rd of March, not far from Newcastle. St. John also records a nearly full-grown young Woodcock from the same locality in the second week in April, and Yarrell mentions two instances of young Woodcocks having been obtained during that month; but these are probably somewhat exceptional cases. The usual date for fresh eggs of the Woodcock in this country is during the month of April. There are several instances on record of fresh eggs of the Woodcock having been taken in July and August, but it is not known that this bird rears more than one brood in the season. The site chosen for the nest is always on the ground, generally on the outskirts of a forest containing plenty of underwood and fern. The nest is a mere depression in the ground, plentifully lined with dead grass and leaves.

Probably the earliest authentic account of the breeding of the Woodcock in England is that recorded by Willughby and Ray, who write, "some stragglers, by some accident left behind when their fellows depart, remain also in England all summer, and breed here. Mr. Jessop saw young Woodcocks to be sold at Sheffield, and others have seen them elsewhere." The Woodcock still breeds in some localities in the neighbourhood. On the 18th of April, 1870, I went over from Sheffield to Edwinstowe, having received information from a gamekeeper that a Woodcock was sitting on four eggs in one of the Welbeck woods. I left the little inn at ten o'clock on a brilliant moonlight night, in the company of a woodman who had discovered the nest about a fortnight previously. The night was warm and still, and we did not meet a soul during our five miles walk through the forest, and scarcely heard a sound, except the occasional cry of a cock Pheasant awakened by our footsteps. Arrived at the spot the woodman pointed out a clump of last year's bracken, under the spreading boughs of one of the old oak trees with which the forest abounds, and in the midst of a number of birch trees which the woodmen were engaged in felling. In the midst of this the nest was placed, on the ground, and was little more than a hollow scratched in the earth and lined with a few leaves and a little dry grass. The bird did not leave her nest until I was within a few feet of her. After watching her disappear under the branches, I bent aside the bracken and looked at the four eggs. As I had never taken Woodcock's eggs before, I said to the woodman that I should like to carry them away; he replied that the gamekeeper knew of his having found the nest, and that if the eggs were taken he would probably lose his situation. The sight of a half-sovereign, however,

developed his imaginative faculties, and he suggested that I should be satisfied with three of the eggs, and that fragments of the shell of the fourth should be scattered close to the nest, to convince the gamekeeper that the eggs had hatched out. This was accordingly done, and the three eggs were brought home to the inn in triumph. On my congratulating him upon the cleverness with which the theft had been made, he replied, "O yes, Sir; I would not have taken you if I had not known that we could have done it innocent."

I am indebted to my friend Mr. A. W. Johnson for the following information respecting the breeding of the Woodcock in the neighbourhood of Newcastle-on-Tyne:—"The Woodcock breeds every year in the woods of Durham and Northumberland; in some seasons in considerable numbers. In one wood in the former county, not ten miles from Newcastle, three broods of birds, one of which I saw myself, were seen last May, and two nests of eggs were taken near Newcastle this season. On the 13th of May, 1880, I saw a nest in the same large wood containing four eggs: it was placed at the foot of a small sapling in a dry part of the wood; and as no brambles or underwood grew over it, the sitting bird could be seen from a considerable distance. She sat so close that we stood for some time within three yards of her; and it was not until we had approached to within a yard that she darted off, leaving her eggs in their setting of withered oak-leaves fully exposed. The eggs contained half-formed young, which appeared to have been dead some time."

The eggs of the Woodcock are four in number, and vary in ground-colour from greyish white to brownish buff; the surface-spots vary in size from a pea downwards, and are reddish brown in colour and very irregular in shape; the underlying spots are quite as large, and are pale greyish brown. They vary in length from 1·8 to 1·6 inch, and in breadth from 1·4 to 1·3 inch. The eggs of the Woodcock are not likely to be confused with those of any other British bird. Eggs of Bartram's Sandpiper have much smaller and darker spots.

The Woodcock has frequently been known to remove its young, carrying them between its legs, and pressed to the body by its bill. St. John is of opinion that "many Woodcocks carry their young ones down to the soft feeding-ground, and bring them back again to the shelter of the woods before daylight, where they remain during the whole day."

The Woodcock is a great favourite amongst sportsmen, not so much from the sport that it yields as from its excellence when brought to table. Woodcocks vary in weight from half a pound to a pound, and some ornithologists have supposed that there is a large and small race of this bird. No satisfactory evidence has yet been produced to show that the difference of size has any connexion with difference of geographical distribution; consequently the variations must be regarded as individual and

not as subspecific. Hume contends that Indian birds are less than those obtained in the British Islands; but I can find no difference in the measurements of British examples compared with those from China and Japan.

It is not known that the sexes of the Woodcock can be distinguished by their plumage. The adult in breeding-plumage is a very handsome bird. The general colour of the upper parts, including the outer webs of the quills, is reddish chestnut, transversely vermiculated with black; the feathers of the hind neck, mantle, and scapulars are also richly and boldly spotted with nearly black and pale grey; and the tail-feathers, which are twelve in number, are black, with grey tips on the upper surface, silver-white tips on the under surface, and with the outer web margined with a row of chestnut spots. The general colour of the underparts, including the axillaries, is greyish buff, barred with brown. Bill dull flesh-colour, shading into dark brown at the tip; legs and feet dull flesh-colour; claws dark brown; irides dark hazel. After the autumn moult the principal change in the colour of the plumage is that the bold pale grey spots on the upper parts are greyish buff. Young in first plumage very closely resemble adults; but the bold pale spots on the upper parts are much less conspicuous, being smaller and chestnut-buff. The most striking difference is to be found in the tail-feathers, in which the grey tips on the upper surface have buff bases, and the chestnut spots on the margin of the outer webs are lengthened into bars reaching to the shaft. Birds of the year are intermediate in these respects between adults and young in first plumage. Young in down have the upper parts rich chestnut-brown, marbled with black and dusted with white, and have the underparts buff, darkest on the breast.

SCOLOPAX MAJOR.

GREAT SNIPE.

(Plate 28.)

Gallinago media, *Gerini*, *Orn. Meth. Dig.* iv. p. 59, pl. cdxlvi. (1773).
Scolopax media (*Gerini*), *Lath. Gen. Syn. Suppl.* i. p. 292 (1787).
Scolopax major, *Gmel. Syst. Nat.* i. p. 661 (1788); **et auctorum plurimorum—**
Naumann, *Temminck*, (*Gray*), (*Gould*), (*Dresser*), (*Saunders*), &c.
Gallinago major (*Gmel.*), *Leach*, *Syst. Cat. Mamm. &c. Brit. Mus.* p. 31 (1816).
Scolopax palustris, *Pall. Zoogr. Rosso-Asiat.* ii. p. 173 (1826).
Telmatias major (*Gmel.*), *Brehm*, *Vög. Deutschl.* p. 615 (1831).
Scolopax leucurus, *Swains. Faun. Bor.-Amer.* ii. p. 501 (1831).
Gallinago montagui, *Bonap. Comp. List B. Eur. & N. Amer.* p. 52 (1838).
Scolopax solitaria, *Macgill. Man. Brit. B.* ii. p. 102 (1842, *nec Hodgson*).
Ascalopax major (*Gmel.*), *Keys. u. Blas. Wirb. Eur.* p. 78 (1840).
Gallinago media (*Gerini*), *Licht. Nomencl. Av.* p. 93 (1854).

The Great Snipe is known to sportsmen by the name of Double Snipe, to distinguish it from the Full Snipe (the Common Snipe) and the Half Snipe (the Jack Snipe). On account of the comparative heaviness of its flight it is sometimes called the Woodcock Snipe; but why it should so often be called the Solitary Snipe, it is not so easy to explain. It is neither more nor less solitary in its habits than the three other British Snipes. As it must be regarded as a somewhat accidental visitor to our islands, which lie on the outer fringe of its geographical distribution, it is probable that solitary stray birds have been often met with, though, both in its summer- and winter-quarters, a swamp which contains one bird is generally found to be inhabited by several more.

The Great Snipe appears to have been unknown both to Linnæus and Brisson, although it was discovered as long ago as 1763, and figured by Frisch in the 'Representations of the Birds of Germany.' It was rediscovered a few years later by Pennant, who described it from an example shot in Lancashire, which was preserved in the Leverian Museum. It can only be regarded as a rare visitor, on spring and autumn migration, to our islands; but it has occurred in most parts of the country, both on the coast and inland, including the Orkneys, Shetlands, and Ireland. It is said to be much rarer in spring than in autumn; but when we consider that in the latter season the birds have to run the gauntlet of thousands of guns which are absent in spring, too much importance must not be attached to the paucity of spring records of its capture.

The geographical distribution of the Great Snipe is a very remarkable

one, extending in summer from Scandinavia to the valley of the Yenesay, but in winter confined to the basin of the Mediterranean and the continent of Africa. The Great Snipe is not even known to pass through Turkestan on migration. It breeds in suitable localities throughout the basin of the Baltic, and in Scandinavia as far north as lat. 70°. In the valleys of the Petchora and the Obb it ranges up to lat. 67½°; but in the valley of the Yenesay it does not go further north than lat. 66½°. There is no satisfactory evidence that it has ever occurred near Lake Baikal or in the valley of the Amoor. It passes through the Caucasus and North Persia on migration, and winters in suitable localities throughout South Africa, a few remaining in the basin of the Mediterranean. It crosses the Straits of Gibraltar, though not in great numbers, in spring and autumn; but in Malta it is said only to occur on the spring migration.

In East Siberia the Great Snipe is represented by a somewhat smaller species, *Scolopax megala*, which passes through China, Formosa, and the Philippines on migration, to winter in the islands of the Malay archipelago. A somewhat larger species, *S. australis*, breeds in Japan and winters in Australia*, and most probably passes the islands of the Malay archipelago on migration. Both these species almost exactly resemble the Great Snipe, except in the colour and shape of many of their outer tail-feathers, which are narrow and banded with brown instead of being broad and pure white for at least the terminal half.

The Great Snipe crosses the Mediterranean on its spring migration earlier in the east than in the west, appearing on the Ionian Islands late in March, but only arriving at Malta and Gibraltar late in April. It passes through North Germany during May, the earliest arrivals at its breeding-grounds in South Scandinavia being about the middle of that month. Both in the valleys of the Petchora and the Yenesay it was one of the last birds to reach the Arctic circle—in the former locality arriving on the 3rd of June, and in the latter on the 11th of that month. It migrates at night, singly or in pairs, but, so far as is known, not in flocks. In the pairing-season the males are gregarious, and have a sort of "lek" like that of the Ruff or of many species of Grouse. Late one evening, as Harvie-Brown and I were drifting down the Petchora, we came upon a large party of these birds, making curious noises with their bills, in the long grass on the banks of the river. Sometimes as many as half a dozen were on the wing at once, but their flights were very short, and we succeeded in shooting ten of them, which all proved to be males. I saw the same remark-

* Mr. A. J. Campbell, in his 'Nests and Eggs of Australian Birds,' p. 57, describes eggs alleged to be of this species taken in Australia. No particulars are given as to their identification, and there can be little doubt that they are the eggs of some other bird, probably of one of the Plovers. In the same book (p. 55) is a description of the egg of the Curlew Sandpiper, an egg which is absolutely unknown to any European oologist.

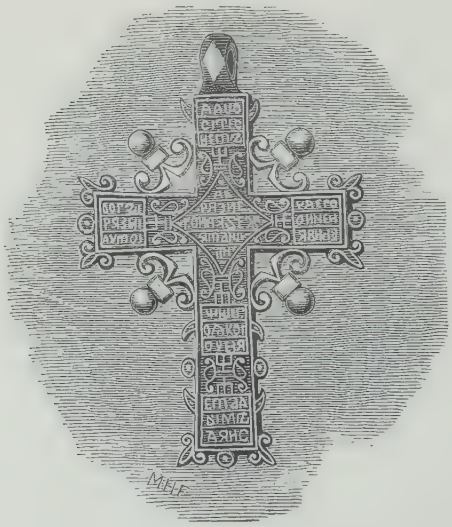
able performance in Siberia, where they were very common in the valley of the Koorayika, and soon after their arrival I used sometimes to watch them in the evenings through my binocular. With a little caution I found it very easy to get near them, and frequently, as I sat partially concealed between a couple of willow bushes, I was able to turn my glass on two or three pairs of these birds all within fifteen or twenty yards of me. They had one very curious habit which I noted; they used to stretch out their necks, throw back the head almost upside down, and open and shut their beaks rapidly, uttering a curious noise like that produced by running the finger along the edge of a comb. This was sometimes preceded by a short flight or by the spreading of the wings and tail. I have never heard the Great Snipe utter any other call or alarm-note. During the breeding-season it is not at all shy, and allows of a near approach; and when resting it almost permits itself to be trodden upon before rising, which it does with a whirr of the wings, like that of a Grouse, but not so loud. It is a much easier bird to shoot than the Common Snipe, flying much slower and straighter. On the ground it is a very comical-looking object: plump, short legged, it shuffles about, half walking, half running, its bill always depressed, and, however intent it may be on feeding, it is ever on the watch for danger, and always tries to keep behind a bunch of rushes or a clump of sedge. It hides in the long coarse grass on the banks of rivers and lakes during the day, and comes out on the open in the evening, if there be any evening where it happens to live, to feed on worms and various small insects.

The Great Snipe is a bird of the swamps, but prefers such as have open places of mud or peat or even sand. In these situations it breeds, sometimes making its nest in the long grass, but more often in the middle of a hillock of sedge or rushes. A small quantity of moss or dead grass is placed as a lining to the depression where its four eggs are laid.

The eggs of the Great Snipe are very handsome, and vary in ground-colour from pale greyish buff (sometimes with the faintest possible green tinge) to pale brownish buff, and are spotted and blotched with rich dark brown and paler brown, and with underlying markings of purplish brown and grey. Most of the blotches are distributed round the largest part of the egg, often in an oblique direction, and many of them are confluent. Some eggs have the large end covered with a network of streaks, but more often only a few lines are seen. The underlying markings are large, numerous, and very conspicuous. The eggs vary in length from 1·9 to 1·7 inch, and in breadth from 1·3 to 1·22 inch. The eggs of the Great Snipe cannot very easily be confused with those of any other British bird.

The Great Snipe, as its name implies, is rather larger than the Common Snipe, but the two species differ very slightly in colour or markings. The upper parts of both species very closely resemble each other; but in the

Great Snipe the white tips of the wing-coverts are much more conspicuous, and the underparts are more profusely barred. The chief distinction lies in the tail: in the adult Great Snipe the terminal half of the four outside tail-feathers on each side is pure unspotted white; in the Common Snipe it is chestnut-buff, with a subterminal dark brown bar. Bill, legs, feet, and claws brown; irides hazel. The female is indistinguishable in colour from the male. After the autumn moult the pale margins and bars on the upper parts are broader and more buff, and the underparts are also more buff. Young in first plumage are difficult to distinguish from adults; the margins of the feathers of the upper parts are narrow as in summer plumage, but are as dark a buff as in winter plumage, whilst the underparts are even more buff than at that season. The four outer tail-feathers are white in ground-colour like those of the adult, but are barred as in the Common Snipe. It is not known that birds of the year are distinguishable from adults, the colour of the wing-coverts being almost the same in adults at all seasons as in young in first plumage. Young in down closely resemble those of the Common Snipe, but are less rufous in colour, especially on the underparts.



SCOLOPAX GALLINAGO.

COMMON SNIPE.

(Plate 28.)

Scolopax gallinago, *Briss. Orn.* v. p. 298 (1760); *Linn. Syst. Nat.* i. p. 244 (1766); **et auctorum plurimorum**—*Gmelin, Montagu, Temminck, Naumann, Gould, Middendorff, Schrenck, Radde, Salvin, Godman, Wright, Allen, Swinhoe, Danford, Harvie-Brown, Anderson,* &c.
Scolopax cœlestis, *Frenzel, Beschr. Vög. u. Eier Wittenb.* p. 58 (1801).
Scolopax sakhalina, *Vieill. N. Dict. d'Hist. Nat.* iii. p. 359 (1817).
Scolopax brehmii, *Kaup, Isis,* 1823, p. 1147.
Scolopax sabinei, *Vigors, Trans. Linn. Soc.* xiv. p. 557, pl. 21 (1825).
Telmatias gallinago (*Linn.*), *Boie, Isis,* 1826, p. 979.
Pelorychus brehmii (*Kaup*), Enalius sabini (*Vigors*), } *Kaup, Natürl. Syst.* pp. 119, 121 (1829).
Gallinago uniclavus, *Hodgs. Journ. As. Soc. Beng.* vi. p. 492 (1837).
Gallinago scolopacinus, *Bonap. Comp. List B. Eur. & N. Amer.* p. 52 (1838).
Scolopax peregrina (*Brehm*), *Temm. Man. d'Orn.* iv. p. 435 (1840).
Ascalopax sabini (*Vig.*), Ascalopax gallinago (*Linn.*), } *Keys. u. Blas. Wirb. Eur.* pp. lxxvii, 216 (1840).
Gallinago russata, *Gould, B. of Great Brit., Introd.* p. cxviii (1873).

Telmatias faeroeensis, brehmii, septentrionalis, stagnatilis, gallinago, peregrina, (sabini), robusta, salicaria, petenyi, lacustris, brachypus, *Brehm.*
Gallinago brehmii, scolopacinus, sabini, japonica, nilotica, burka, lamottii, pygmæa, picta, ægyptiaca, *Bonaparte.*

The Common Snipe is generally distributed throughout the British Islands, breeding wherever swampy ground, even of limited extent, is to be found. It is commoner in Scotland than in England, but most numerous in Ireland, where the extensive bogs provide it with the haunts it loves. It breeds in the Orkneys and Shetlands and in most of the Hebrides. It is a resident in our islands, but its numbers are considerably increased in autumn by migrants from the continent.

The Common Snipe has a very extensive range, indeed it may be regarded as a circumpolar bird, though the Nearctic form differs in some respects from ours. This form is probably only subspecifically distinct from the Common Snipe, and should bear the name of *Scolopax gallinago wilsoni.* It is not known to which form the Greenland birds belong, nor are the ranges of the two races satisfactorily determined in East Siberia. It is supposed that the Common Snipe has only fourteen, but the American Snipe sixteen tail-feathers, the outermost of which are darker and more broadly barred with brown than in the Old-World species. It is said that

Snipes with sixteen tail-feathers are occasionally found in Europe; but I have never had the good fortune to meet with one, and in the absence of any information respecting the barring of the outer tail-feathers of these examples it is impossible to say whether they are American birds which have migrated to Europe or not. Hume states that in India Snipes are frequently met with having sixteen tail-feathers, but also omits to give any information respecting the barring of the outer ones. I have examined great numbers of Snipes from China and Japan without being able to detect more than fourteen tail-feathers. The subject requires further investigation.

The Common Snipe breeds in Iceland and the Faroes, and a few are said to remain in both these localities during the winter. It breeds throughout the whole of North Europe and Siberia, but is very rare north of lat. 70°, and in the southern portions of its breeding-range is chiefly confined to mountain-ranges. It is known to breed on the southern slopes of the Alps, and occasionally in South Russia. Both Severtzow and Scully found it breeding in Turkestan; and Prjevalsky says that a few remain to breed in South-east Mongolia. It is a winter visitor to the basin of the Mediterranean and to North Africa, as far south in the west as the Azores, Madeira, Canaries, and the valley of the Gambia, and in the east as far as the southern shores of the Gulf of Aden. Loche says that it has been known to breed in Algeria. In Asia it winters in Persia, India, Ceylon, the Andaman Islands, and Burma, and it has once occurred on the Malay peninsula. It passes along the coasts of Japan on migration, and winters in China, Formosa, and the Philippine Islands.

The American form of the Common Snipe breeds in the Northern States and in British America up to the Arctic circle, wintering in the Southern States, the Bermudas, the West Indies, and in South America north of the equator. In South Africa the Common Snipe is represented by a more distantly allied species, *S. æquatorialis*, which also has sixteen tail-feathers, and otherwise differs from our bird in having the dark brown of the upper parts replaced by velvety black, and the ground-colour of the two or three outer tail-feathers on each side nearly pure white.

Although the Common Snipe is apparently a resident in the British Islands, it is only a summer visitor to the northern portions of the continent of Europe. It is one of the earliest birds of passage to arrive in spring, appearing in Central Germany, in favourable seasons, during the first half of March, and reaching Denmark before the close of that month. It arrives in South Finland late in April, but does not reach Lapland until the end of May. On the Arctic circle, in the valley of the Yenesay, I did not observe it before the first week of June, the fact being that on the first of that month the whole country (lakes, rivers, and all) was covered with snow to a depth of five or six feet. The return migration lasts in Central Germany from the middle of August to the middle of October.

Few birds are more solitary in their habits than the Snipes; although fifty couple or more have been known to fall to one gun in a single day, I have never seen or heard of a flock of Snipe. It often happens that on one of their favourite marshes Snipe may be abundant one day, whilst on the next not a bird can be found; but on the marsh itself they are put up here and there at some distance from each other; and observers who have been fortunate enough to remark them on migration say that they travel singly or at most in pairs. Unless disturbed, the Snipe is rarely seen on the wing during the day; it migrates at night, and feeds principally at dusk. It is remarkably skulking in its habits, and is essentially a swamp-bird, delighting in sedge, rushes, and the coarsest grass, and prefers those parts of the plain or plateau where all three are to be found. If there be nothing but sedge, the water is probably too deep for the short legs of the Snipe; and if there be only grass, the ground will generally be too hard for its soft, sensitive bill. The point of a Snipe's bill is hard, but the subterminal portion is soft, and after death dries up into a reticulated surface, which represents the walls of cells from which proceed nerves, by which the bird feels for its food in the soft mud. The footprints of a Snipe on the mud are surrounded with holes, where it has probed the ground in search of food. It eats insects of all sorts, worms, the larvæ of water-beetles &c., slugs, and small shell-fish; and it is said that roots are sometimes found in its stomach, which also contains a few small stones to assist in digestion. Neither the sand of the sea-shore nor the mud-banks exposed at low water in the estuaries of rivers have any attraction for the Snipe. Its haunts are the same in winter as in summer, hence it does not change the colour of its dress with the seasons. At all times of the year it trusts for its safety during the day to the security of the cover of sedge or rush, only venturing out on the short grass or on the exposed banks of a pond or a stream under cover of twilight. Except on migration, it skulks in the swamps during the day, and when disturbed rises very suddenly from the ground, with little or no whirr of wing, but frequently uttering a long-drawn, harsh note, something like the syllable *skaych*. On the wing it goes like the wind for the first few seconds, in a zigzag course, like a hare pursued by the hounds, but soon flies steadily and drops down into cover again when it imagines itself out of danger.

In the breeding-season the note of the Snipe is a rapidly-uttered *tyik-tyuk*, each syllable accompanied by a depression of the head. This note is common to both sexes; but perhaps the most interesting fact connected with the history of the Snipe is the well-known drumming of the male bird during the pairing-season. He may then be seen in broad daylight high in air, wheeling round and round in enormous circles, flying diagonally upwards with rapid beat of wings, then swooping down an imaginary inclined plane with half-expanded and visibly vibrating wings, but with outspread tail,

uttering a sound which is technically called "drumming." The sound is only heard when the bird is descending, but some observers assert that they have heard it proceeding from a Snipe on the ground or perched on a dead branch. It has been likened to the bleating of a goat, and bears some resemblance to the suppressed gobble sometimes heard from a Turkey. Great difference of opinion exists as to the means by which this sound is produced. Bechstein and many subsequent writers have argued that it proceeds from the throat. Naumann, Macgillivray, Hancock, Saxby, Jardine, Blyth, and others have maintained that it is caused by the rapid vibration of the wings. Altum, Meves, and most modern ornithologists find the musical instrument in the rush of the air through the stiff feathers of the outspread tail; and Legge thinks the sound is produced by the combined action of wings and tail. I have listened to the drumming of the Snipe scores of times with the express purpose of discovering the mode in which the sound is produced, and must confess myself completely puzzled. Arguing from analogy (a very dangerous proceeding, by the way, in ornithology) I should say it was produced by the vocal organs, and is analogous to the trill of the Stints and other Sandpipers. The fact that it appears to begin the instant the bird begins to descend inclines me to think that, after allowance is made for the time it takes for sound to travel, it must really begin before the descent, whilst the bird is not moving very rapidly.

Although the Snipe appears to be almost exclusively a ground-bird, its occasional habit of perching in trees, generally on a dead branch, and by preference on the topmost twig, has been noticed and recorded by Naumann and many other writers; and in North Russia I have seen my friend Harvie-Brown shoot a Snipe which was perched on the topmost twig of a larch just bursting into leaf, at least fifty feet from the ground.

Fresh eggs of the Snipe may be obtained from the middle of April to the middle of May. Exceptionally early clutches have been recorded as early as the last week of March, but in the Arctic regions it does not breed until the middle of June. The nest is a mere depression lined with dead grass, and is generally placed in a bunch of rushes or sedge in the middle of a swamp. The eggs, nearly always four in number, vary in ground-colour, on the one hand from pale greyish buff to rich brownish buff, and on the other from pale olive to pale greyish green, spotted and blotched with rich dark brown, and with underlying markings of pale brown and grey. Most of the blotches are on the large end of the egg, often placed obliquely, and many of them confluent; sometimes they form a broad irregular zone, and are often intermixed with very dark-brown streaks and scratches. The underlying markings are large, numerous, and very conspicuous. The eggs vary in length from 1·65 to 1·5 inch, and in breadth from 1·15 to 1·05 inch. The eggs of the Common Snipe very closely

re emble those of the Jack Snipe, but are on an average slightly larger. It is also very difficult to distinguish some eggs of the Common Snipe from certain varieties of those of the Purple Sandpiper.

The Snipe is very abundant in India during the cold weather, and frequents the rice-fields and the swamps in such numbers that as many as a hundred couples have been killed to one gun during the day. It is generally considered wise to walk down wind, for if the bird is missed as it rises, its almost invariable habit of turning round so as to fly up wind gives the guns a second chance of a shot.

The Common Snipe in breeding-plumage has the general colours of the upper parts brown, glossy black, and buffish chestnut, the principal features being the pale eye-stripes and mesial line on the crown, and four pale longitudinal bands formed by the outer webs of the scapulars and the outermost feathers of the mantle, which are broadly margined with buff. The quills are brown, the secondaries broadly tipped with white; the tail-feathers are chestnut mottled with black, and have black bases and white tips. The underparts are buffish white, barred with chestnut and brown on the neck, breast, flanks, and axillaries. Bill dark brown, paler at the base and darker at the tip; legs, feet, and claws brown; irides hazel.

Very few species of Plovers or Sandpipers vary much in the plumage of the sexes, but in most of them the difference between summer and winter plumage, and between either of these and young in first plumage, is well marked. The Snipes form an exception to this rule. In the Common Snipe the differences are so slight that they have been overlooked by most writers. In newly moulted birds in both spring and autumn plumage the general colour of the pale portions of the upper parts is pale chestnut-buff, which, before long, fades into the buffish white of the summer and winter plumages. This change in colour still continues on the wing-coverts and the outermost of the innermost secondaries, which are not moulted in spring, the latter frequently losing all their colour and becoming ragged on the edges. Young in first plumage may be detected by the more uniform colour of their upper parts, and by their wing-coverts, which in adults are brown and have broad pale buff tips divided by a dark shaft-streak; but in the young in first plumage these pale tips are not divided by a shaft-line, and one or more chestnut bars cross each feather parallel to them. The two outer of the four pale streaks on the upper parts formed by the pale borders of the outer webs of the scapulars are narrower and paler than in adults. After the first spring moult the barred wing-coverts still remain, except that occasionally a few of the most worn are replaced by the unbarred feathers of the adult plumage. Young in down are bright chestnut, mottled with black and dusted with white on the upper parts.

Although the Snipe is subject to so little seasonal changes of plumage, it varies individually in colour to a considerable extent. Examples are

sometimes met with in which the plumage is of a uniform dark brown, and these have been described as a new species under the name of *Scolopax sabinii*, but there is no doubt that they are merely melanistic varieties of the Common Snipe; whilst, on the other hand, examples are sometimes obtained having the axillaries and a great portion of the under surface of the wing white, which, in a similar manner, are nothing but semi-albino varieties.

COMMON SNIPE'S NEST.

SCOLOPAX GALLINULA.

JACK SNIPE.

(Plate 28.)

Scolopax gallinago minor, *Briss. Orn.* v. p. 304, pl. 26. fig. 2 (1760).
Scolopax gallinula, *Linn. Syst. Nat.* i. p. 244 (1766); **et auctorum plurimorum**—*Naumann, Temminck, Schlegel, (Bonaparte), (Dresser)*, &c.
Gallinago minima, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 31 (1816).
Lymnocryptes gallinula (*Linn.*), *Kaup, Natürl. Syst.* p. 118 (1829).
Gallinago gallinula (*Linn.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 52 (1838).
Philolimnos gallinula (*Linn.*), *Brehm, Vög. Deutschl.* p. 623 (1831).
Ascalopax gallinula (*Linn.*), *Keys. u. Blas. Wirb. Eur.* p. lxxvii (1840).
Telmatias gallinula (*Linn.*), *Droste, Vög. Bork.* p. 234 (1869).

The Jack Snipe is a regular winter visitor to the British Islands, and is generally but sparingly distributed wherever marshy ground is to be found, not only in England, Scotland, and Ireland, but also in all the surrounding islands where suitable localities exist.

The Jack Snipe is a very local bird, but appears to be irregularly distributed in the Arctic regions during the breeding-season, from the Atlantic to the Pacific. It breeds on the Dovrefjeld, above the limits of forest-growth, and throughout the tundras of Lapland. Henke says that it is only seen on migration at Archangel; Hoffmann records it from the source of the Petchora; and Middendorff met with it on the Boganida river, south of the Taimur peninsula, in lat. 70°. It doubtless breeds in North-east Siberia, since it has occurred repeatedly in Japan and once in Formosa. Dybowsky did not meet with it near Lake Baikal; but Finsch records it on migration in South-west Siberia; Severtzow says that it passes through Turkestan, and Bogdanow records it in spring and autumn in the valley of the Volga. It winters throughout the basin of the Mediterranean, and inland in Africa north of the Great Desert, as well as in Persia, Afghanistan, India, Ceylon, and Burma. The Jack Snipe has no very near ally.

The Jack Snipe leaves our shores in March and is a rare bird in April, a fact suggesting the idea that the birds which visit our islands are those which breed in the south of the Scandinavian peninsula. In Central Germany Jack Snipes seldom occur except on migration, and are commonest in spring, from the end of March to the end of April—evidently birds breeding a month later than those which winter with us, and consequently going further north. In the north of Siberia Middendorff first observed them on the 8th of June. In England the Jack Snipe returns from its breeding-grounds in

October; but it passes through Central Germany and even Holland in August and September, clearly showing that the birds which winter furthest south breed furthest north.

In its habits the Jack Snipe differs little from its commoner ally. It is quite as fond of marshes, but is perhaps more often seen on the coast. It is at all times as solitary, though one swamp may contain many scattered birds of either species. It sits as close or even closer than the Common Snipe, but, unlike that bird, it gets up, with very rare exceptions, without uttering a note. On the wing its flight is slower and more bat-like, but it zigzags quite as much. Its food is probably the same.

The egg of the Jack Snipe was one of the many great prizes which Wolley brought home from his adventurous visit to Lapland. He made his head-quarters at Muoniovara, opposite Muonioniska, on the frontiers of Sweden and Russia, about halfway between the North Cape and the head of the Gulf of Bothnia—a wild district of endless swamps, half water, half tussocks of sedge, relieved only by forests of pine and birch, where the rising ground secures them from being drowned out. He was out on the great marsh, with his Finnish interpreters, on the 17th of June, 1853, when his attention was arrested by the note of a bird with which he was unacquainted. One can fancy the thrill of intense interest that passed through the intrepid pioneer as the unfamiliar sound reached his ear. His servant suggested that it might proceed from a Capercaillie in the pine-forest on the hills beyond; but he soon discovered that it came from a small bird, which was careering at a wild pace high over the marsh. He describes the note as clear and hollow—a quadruple note, not unlike the distant canter of a horse over a hard hollow road—a weird note, which Naumann likens to the monotonous click of the death-clock—the love-song of the Jack Snipe. Wolley had never heard it before, and did not know what it was; but in the course of the day he found a nest which was strange to him. So the next morning he returned to the great swamp, with a number of natives to act as beaters. He ranged his men in a line, with his Swedish travelling-companion at one end, his Finnish interpreter at the other, and himself in the middle. Steadily they march across the swamp, a long line of beaters, every eye on the *qui vive* for birds. After some hours' patient marching, Wolley sees a bird get up, marks it down, finds the nest: it has eggs in it—strange eggs! Wolley's expectations are raised to the highest pitch: he goes to the spot where he had marked the bird; it rises, but after a short low flight drops suddenly into cover. Wolley follows it; once more it rises, the gun is fired, the bird drops, and Wolley holds in his hand a veritable Jack Snipe. It is impossible to describe the exultation with which he looks at the eggs, now identified; but a writer who has stood over the nest of a Grey Plover or a Little Stint, with the bird lying dead by the eggs, may be permitted to sympathize with his joy.

Poor Wolley! he had no kindred spirit at his side to share his triumph, to appreciate its magnitude, or with whom he might discuss every detail of the discovery. It was not until a year later that he was able to tell his story, in the far-away little town of Vadsö, to ears which were able to appreciate the intense interest of it. After Wolley and his party on the great marsh had all shared in the gratification of the discovery, the line was again formed; the search continued all that day and throughout what represents the night (for Muonioniska lies in the land of the "nightless north"), with the fortunate result that three more nests were found, and the birds belonging to each examined: one was so tame that it allowed Wolley to touch it with his hand before it rose, and another only got up when he was within six inches of it. The nests were all very similar—a mere depression in the dry sedgy or grassy ground close to the open swamp, lined with little pieces of grass and horsetail, with a few dead leaves of the dwarf birch.

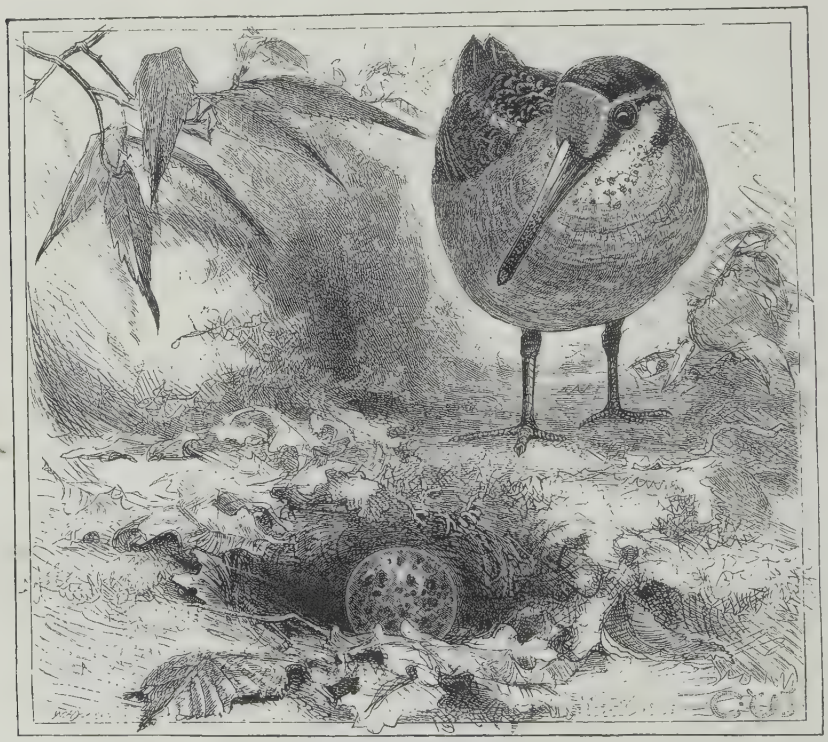
It is very difficult to tell from Wolley's journal whether the curious sound which he described was supposed by him to represent the drumming of the Common Snipe, or whether the Jack Snipe can drum in addition. Naumann only knew the one note, but it must be remembered that he never saw the bird at its breeding-grounds.

A full clutch of eggs of the Jack Snipe is always four. The ground-colour goes through precisely the same variations as that of the Common Snipe's eggs, but the blotches and spots are a richer brown and not, as a rule, quite so bold. The underlying markings are large and very distinct. The eggs are remarkably large for the size of the bird, and vary in length from 1·56 to 1·45 inch and in breadth from 1·1 to 1·02 inch. On an average, the eggs of the Jack Snipe are a little smaller than those of the Common Snipe; but it is impossible to give any character by which they may with certainty be distinguished from them. Some varieties of those of the Dunlin resemble those of the Jack Snipe, but may be distinguished by their smaller size. Eggs of the Buff-breasted Sandpiper are absolutely indistinguishable. It is not known that the Jack Snipe rears more than one brood in the year.

In its winter-quarters in India the Jack Snipe is described as being very capricious in its choice of an abode, abounding in its favourite corners and avoiding other less favourable localities. It is said to require thicker cover than the Common Snipe, to sit closer, to be even more solitary in its habits, to be more silent, and less rapid in its flight.

The Jack Snipe is a much smaller bird than the Common Snipe, varying in weight from one ounce to two ounces and a half, whilst the Common Snipe varies from three ounces to five ounces and a half. The difference in colour is comparatively small. The chief points in which the Jack Snipe differs from the Common Snipe are as follows:—it has no pale mesial line

on the crown; the feathers on the mantle are glossed with purple and the inside webs of the scapulars with green, whilst the inside webs of the innermost secondaries are plain unbarred brown; the tail-feathers are nearly uniform in colour, the obscure markings being longitudinal and not transverse. There is even less difference observable in the colour of the underparts, except that the axillaries are pure white, only occasionally clouded with brown—a feature which occurs very rarely in the Common Snipe. Bill brown, palest at the base and darkest at the tip; legs and feet olive-brown; claws nearly black; irides hazel. The differences attributable to age, sex, and season are so slight as to be scarcely perceptible. Young in down scarcely differ from those of the Common Snipe.



WOODCOCK'S NEST.

Family LARIDÆ, or GULLS.

The Gulls and their allies are a large group of birds which have become somewhat isolated, though they are allied to the Plovers, to the Petrels, and to the Auks; but it would be difficult, if not impossible, to determine to which of these three families they are most nearly related. Forbes differed from this opinion to the extent that he removed the Petrels from the vicinity of the Gulls, but placed the Ibises and Spoonbills near them. Sclater elevates the Laridæ to the rank of an order, placing it between the Plovers and the Petrels. There are two notches on each side of the posterior margin of the sternum, as in most of the Plovers and Sandpipers. In the modifications of their cranial bones they belong to the group which includes both the Game Birds and the Plovers.

In their seasonal changes of plumage the Gulls and Terns differ very little from the Plovers and Sandpipers. The young when first hatched are covered with down and able to take care of themselves. The first feathers appear almost immediately, and fully fledged young in first plumage are probably not more than a month old. It is no sooner completed than, with some exceptions, they commence to moult into the plumage of birds of the year, even whilst they are being fed by their parents. In February they begin their first spring moult, and six months later their second autumnal moult takes place in August. After this moult the Terns are in adult plumage; the small Gulls show few traces of immaturity; but the larger Gulls show few signs of maturity at this age, and do not attain fully adult plumage until their fourth or fifth autumn. In both moults if a feather is in good condition it is not renewed, but changes colour where the colours of summer and winter plumage differ.

The birds belonging to this family have long pointed wings, short legs, and small feet. The tarsus is scutellated in front and reticulated behind.

This family contains about a hundred species, and may be regarded as cosmopolitan in its range.

The geographical distribution of the Laridæ presents some features of unusual interest. This group of birds may be divided into two classes, one consisting of inland species, the other of oceanic species. The geographical range of the continental species conforms in its broad lines to the geographical regions as finally arranged by Sclater; whilst that of the oceanic species appears to bear no relation to them, and must be considered

from the point of view taken by Günther when he proposed the geographical regions for fishes, divisions which Boulenger has since ascertained to be applicable also to Batrachians.

Genus STERNA.

The genus *Sterna* was recognized by Linnæus in 1766, in the 12th edition of his 'Systema Naturæ,' i. p. 227. The Arctic Tern, *Sterna arctica*, is generally recognized as the type of the genus, though it would be very difficult to assign any reason for the preference.

The Terns may be distinguished from the Gulls and Skuas (except from Sabine's Gull) by their more or less forked tails. They have long slender bills, the curvature of the profile of the upper mandible scarcely varying from base to tip. They have long wings, short tarsi, and small feet.

This genus may be regarded as cosmopolitan; it contains about fifty species. Eleven of these have been considered by Saunders to be sufficiently aberrant to warrant their removal to other genera; but, as is usually the case when Nature's natural divisions are interfered with, the subdivider is obliged to fall back upon specific characters to diagnose his genera, and consequently the eleven species require four genera for their accommodation. It is only fair to say that other ornithologists have split up the Terns into twenty or more genera.

The Terns are found on inland lakes, but principally frequent the sea-coast and the adjoining lagoons. They are remarkable for the singular gracefulness of their flight; and may be said almost to live in the air. Upon the ground they walk clumsily, but they can swim with ease. They are more or less gregarious at all seasons. They feed on small fish, crustaceans, insects, &c., which they secure whilst hovering above the water or by a sudden plunge into it. Their notes are harsh. They make little or no nest, depositing their eggs in a slight depression in the sand or shingle, or amongst marine vegetation.

The following artificial key to the British species of Terns will enable the student to name them in any plumage :—

A. Fork of tail less than 1 inch deep; length of wing from $7\frac{1}{2}$ to 10 inches.
  a. Under wing-coverts black ..... S. LEUCOPTERA*.

* The White-winged Black Tern is the most distinct of all the Terns in summer plumage, no other species having the under wing-coverts black. Young birds and adults in winter plumage are much more difficult to determine. In these plumages there does

b. Under wing-coverts white or pale grey.
a[1]. Wing about 9 inches; tarsus ·9 inch ..... S. HYBRIDA.
b[1]. Wing about 8 inches; tarsus ·65 inch ..... S. NIGRA.
B. Fork of tail more than 1 inch deep; length of wing from $6\frac{1}{2}$ to 16 inches.
c. Upper parts nearly black ..... S. FULIGINOSA.
d. Upper parts mostly grey.
c[1]. Wing more than 11 inches; tarsus more than 1 inch.
a[2]. Wing more than 14 inches; tarsus more than $1\frac{3}{4}$ inches ..... S. CASPIA.
b[2]. Wing less than 13 inches; tarsus less than $1\frac{1}{4}$ inches.
a[3]. Culmen more than 2 inches ..... S. CANTIACA.
b[3]. Culmen less than 2 inches ..... S. ANGLICA.
d[1]. Wing under 11 inches; tarsus less than 1 inch.
c[2]. Wing 9 to 11 inches; tail $5\frac{1}{2}$ to 9 inches.
c[3]. Wing and tail about equal length ..... S. DOUGALLI.
d[3]. Tail one third shorter than the wing.
a[4]. First primary with the grey stripe along the shaft of the inner web no broader than the outer web ..... S. ARCTICA.
b[4]. First primary with the grey stripe along the shaft of the inner web twice as broad as the outer web ..... S. HIRUNDO.
d[2]. Wing 7 inches or less; tail 4 inches or less ..... S. MINUTA.

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not appear to be any difference in colour between the three Marsh-Terns, and scarcely any structural differences, except those of size, which are very insignificant. The White-winged Black Tern varies in length of wing from $7\frac{3}{4}$ to $8\frac{1}{4}$ inches, and its tarsus measures $\frac{3}{4}$ inch. The Whiskered Tern has generally a longer wing and a longer tarsus; whilst the Black Tern has a wing of the same length as that of the White-winged Black Tern, but a shorter tarsus, measuring only $\frac{5}{8}$ inch long. These measurements generally suffice to determine the species of European examples, but small examples of the Whiskered Tern are indistinguishable from large examples of the White-winged Black Tern, unless traces of summer plumage can be found on the under wing-coverts.

STERNA NIGRA.

BLACK TERN.

(Plate 49.)

Sterna nigra, *Briss. Orn.* vi. p. 211, pl. xx. fig. 1 (1760); *Linn. Syst. Nat.* i. p. 227 (1766); **et auctorum plurimorum** — *Naumann, Temminck, Dresser, Saunders*, &c.

Sterna atricapilla,
Sterna nævia,
Sterna cinerea,
} *Briss. Orn.* vi. pp. 210, 214, 216 (1760).

Sterna fissipes, *Linn. Syst. Nat.* i. p. 228 (1766).
Larus merulinus, *Scop. Ann. I. Hist. Nat.* p. 81 (1769).
Sterna fusca, *Tunstall, Orn. Brit.* p. 3 (1771).
Sterna obscura, *Gmel. Syst. Nat.* i. p. 608 (1788).
Sterna brunnea, *Forster, Syn. Cat. Br. B.* p. 63 (1817).
Hydrochelidon nigra (*Linn.*), *Boie, Isis*, 1822, p. 563.
Viralva nigra (*Linn.*), *Steph. Shaw's Gen. Zool.* xiii. pt. i. p. 167 (1825).
Hydrochelidon fissipes (*Linn.*), *Gray, Gen. B.* iii. p. 660 (1846).
Hydrochelidon lariformis, *Coues, Birds of N.-W.* p. 704 (1874).

The pretty little Black Tern is now, alas, only a visitor to the British Islands during spring and autumn migration. Half a century ago it bred every season in considerable numbers on Romney Marsh in Kent, on many of the Norfolk broads, and in some of the Lincolnshire fens. It is not known to have remained to build its nest in this country for the last five-and-twenty years; incessant persecution combined with the drainage of marshes has driven it away, though it still passes our coasts on its way to and from Denmark and Sweden. It is most abundant in the southern and eastern counties of England, but is much rarer in Scotland, though it has once been seen as far north as the Shetland Islands. To Ireland it is only an accidental visitor on migration.

Fortunately the Black Tern breeds in enormous numbers in various parts of the continent. It is found on both coasts of the Atlantic, but must be regarded as an inland species, whose geographical distribution ranges somewhat further to the north, and much further to the west, than that of its allies. Its most northerly known breeding-ground is in Esthonia, on the southern shores of the Gulf of Finland. Thence its breeding-range extends through South Sweden and Norway, Denmark, Holland, France, and Spain, to Algeria in the west, and through the province of Kasan and South-west Siberia to Turkestan and the Altai Mountains in the east. It breeds in suitable localities in the basin of the Mediterranean, except in Egypt. So far as is known, all the Black Terns in the eastern hemisphere from Spain to the Altai Mountains winter in North Africa; but a single

example has occurred in West Africa, in the Cameroons. It is not known that the Black Tern visits any of the Atlantic islands, but on the continent of America a form occurs so nearly allied as to be doubtfully distinct *. *Sterna nigra surinamensis* is, as a rule, somewhat darker and browner on the underparts than European birds, but intermediate forms occur which connect the two subspecies together. The American form breeds across the continent, from South Alaska to South Canada, ranging as far south as the Northern United States. It passes through the Southern States on migration, and winters in Mexico, the West Indies, Central America, and the northern portions of South America.

It is not known that the Black Tern winters in any part of Europe; it arrives late in spring, and retires early in autumn. It makes its first appearance in Spain late in April, and Irby noticed numbers crossing the Straits of Gibraltar on the 16th of May. It passes at once to its breeding-grounds, reaching Denmark late in May. The return migration begins late in July, it passes through France in August, and recrosses the Straits in September and October.

The Black Tern is rarely seen on the sea-coast; it is essentially a lake-bird, and prefers such as are full of beds of reeds and rushes. It delights in large ponds full of horsetails (*Equisetum*), and sheets of water sprinkled over with water-lilies and different species of pond-weed (*Potamogeton*). It is one of the most gregarious of birds, and one of the most graceful on the wing. The flocks of these birds, which skim like Swallows over the water, often hovering like Kestrels over a luckless little fish, add a wonderful charm to the landscape, whether it be near the lakes on the sandy heaths of South Holland, or the floating islands of the lagoons on the Pomeranian coast, or the marshes not far from Copenhagen, or the almost endless extent of flooded country on the banks of the Lower Danube. In all these localities I have watched them for hours or taken their nests. The Black Tern is a late breeder, and it is useless to look for eggs in Denmark before the first week of June, or on the Danube before the last week of May. When a colony of these birds is invaded, their notes are constantly heard; the most common ones may be represented by the syllables *kik* and *kek*, but occasionally a long-drawn *kre-e-e* is uttered. The nests are built on floating weed, and can very rarely be reached without a boat; they are

* The synonymy of the Eastern form is as follows:—
Sterna surinamensis, *Gmel. Syst. Nat.* i. p. 604 (1788).
Sterna plumbea, *Wilson, Am. Orn.* vii. p. 83, pl. 60 (1813).
Anous plumbea (*Wils.*), *Steph. Shaw's Gen. Zool.* xiii. pt. i. p. 142 (1825).
Hydrochelidon surinamensis (*Gmel.*), } *Bonap. Compt. Rend.* 1856, p. 773.
Hydrochelidon plumbea (*Wils.*), }
Hydrochelidon lariformis surinamensis (*Gmel.*), *Ridyw. Nom. N. Am. Birds*, p. 53 (1881).

placed in somewhat scattered colonies, and each nest is a substantial structure of rotten reeds, dead horsetails, or decaying pond-weed or other water-plant. Three is a full clutch of eggs. They vary in ground-colour from greyish buff to buffish brown, and are thickly spotted and blotched with rich reddish brown and very dark blackish brown, with underlying markings of greyish brown and inky grey. Few eggs are more boldly marked than those of the Black Tern. On most of the eggs the large blotches are confluent, often forming broad irregular bands round the broadest part of the shell or round the large end. Some eggs have the markings smaller and more evenly distributed over the surface. The underlying spots are often large and generally conspicuous. The eggs vary in length from 1·46 to 1·3 inch, and in breadth from 1·05 to ·9 inch. It is impossible to give any characters by which the eggs of the Black Tern can be distinguished from those of the White-winged Black Tern; but those of the Whiskered Tern can readily be distinguished by their larger size, and on an average paler and greener ground-colour and smaller markings. Although the eggs of the Whiskered Tern overlap in measurements those of the Black Tern, they are constantly larger in bulk.

The Black Tern feeds principally on insects, worms, water-beetles, and aquatic larvæ of all kinds; it also catches dragon-flies and other insects on the wing, and occasionally drops down on a fish or a tadpole. In its winter-quarters it frequents marshes and lakes in small parties; and my friend Mr. Labouchère has seen the American form of this species following the plough on the prairie farms of Minnesota to feed on the worms and grubs.

The Black Tern is the smallest British Tern, except the Lesser Tern. It has long wings, but the tail has not a deep fork (about $\frac{3}{4}$ in.). The adult in summer plumage has the entire head, neck, breast, and belly sooty black; the vent and the under tail-coverts are white, and the rest of the plumage is slate-grey, much paler on the under wing-coverts. Bill black; legs and feet reddish brown; irides dark hazel. After the autumn moult the forehead, lores, chin, and throat become white, and the breast and belly are barred with white.

After the first spring moult the young bird differs from the adult in having nearly black lesser wing-coverts, and in having the belly barred with white; whilst in birds of the year the black also extends to the mantle and scapulars, and the underparts are pure white.

Young in first plumage differ from birds of the year in having a white collar round the neck, and in having pale margins and brown sub-margins to nearly all the feathers of the upper parts: the fork of the tail is only half the depth, and the bill is brown.

Young in down have the upper parts chestnut, mottled with black; and the underparts buff, except the throat, which is brownish black.

STERNA LEUCOPTERA.

WHITE-WINGED BLACK TERN.

(Plate 49.)

Sterna leucoptera, *Meisner & Schinz, Vög. Schweiz*, p. 264 (1815); *Temm. Man. d'Orn.* p. 483 (1815); **et auctorum plurimorum** — *Naumann, Yarrell, Dresser, Saunders*, &c.

Hydrochelidon leucoptera (*Schinz*), *Boie, Isis*, 1822, p. 563.

Viralva leucoptera (*Schinz*), *Steph. Shaw's Gen. Zool.* xiii. pt. i. p. 170 (1826).

Hydrochelidon nigra (*Linn.*), *apud Gray, Blasius, Swinhoe, Gurney, Degland & Gerbe, Coues*, (*Schlegel*), &c.

The White-winged Black Tern was figured by Gerini in the last volume of the work published after his death in 1776, and was accurately described by Pallas about the year 1800 in his posthumous work, which, though printed in 1809, was not published until 1826. Both these naturalists identified the White-winged Black Tern with the *Sterna nigra* of Brisson, having evidently paid more attention to Brisson's *bad* figure than to his *good* description. It appears to have been rediscovered by Schinz in Switzerland in 1815, who either adopted Temminck's name published in the same year, and apparently founded on Gerini's figure, or applied the same name to it by a singular coincidence.

Its earliest known occurrence in the British Islands was in October 1841, near Dublin (Thompson, 'Birds of Ireland,' iii. p. 307). Since then a second example has occurred near the same locality, and, more recently, in the spring of 1875, a third Irish example was obtained near Limerick, and a fourth in the county of Waterford. It has not occurred in Scotland, but in England a score or more examples have been seen and most of them obtained: two were shot near Coventry in June 1857 (Gould, 'Birds of Great Britain,' v. no. 76); one was shot at Scarborough in 1860; one was seen near Flamboro' Head in spring 1867 (Cordeaux, 'Birds of the Humber,' p. 197); and one was shot near Ilfracombe, North Devon, early in November 1870. In addition to these others have been obtained or seen in Northumberland, on the Hampshire and Dorsetshire coasts, near Eastbourne, near Newhaven about May, and at Scilly in May or June. It has been obtained many times in Norfolk. One was shot on Horsey Mere on the 17th of May, 1853 (Frederick, 'Zoologist,' 1853, p. 3911); another was shot on Hickling Broad on the 27th of June, 1867 (Stevenson, 'Zoologist,' 1867, p. 951); four were shot out of a flock of five on Breydon Water on the 26th of May, 1871 (Stevenson, 'Zoologist,' 1871, p. 2830); five were

killed out of a flock of twelve on Hickling Broad on the 30th of May 1873 (Stevenson, 'Zoologist,' 1873, p. 3712); and one was shot out of a pair on one of the Norfolk broads on the 10th of June, 1883 (Chase, 'Zoologist,' 1883, p. 341).

There is no evidence to prove that this bird has ever bred in our islands, but the records quoted above lead to the supposition that it formerly did so, and would do so again if the rapacity of bird-collectors would allow it. It is quite possible that it may have occurred more frequently in autumn, since the similarity of its winter plumage to that of its nearest allies would probably cause it to escape detection.

The White-winged Black Tern is an inland species, and does not differ much in its geographical distribution from the Whiskered Tern. It breeds in South Russia, Hungary, and probably in the delta of the Rhone, but it only visits Spain on migration. Further north it is an accidental visitor to Northern France, Germany, and Denmark, but it is only known to have occurred once in Sweden. It is said to breed in Algeria and in some of the islands of the Mediterranean. Further east it breeds in the plains of the Caucasus, and probably in Turkestan, as it is a regular summer visitor to the rivers, lakes, and marshes throughout the extreme south of Siberia, Mongolia, and North China. The European and West-Siberian birds apparently winter in Africa as far south as Damara Land and the Transvaal, whilst the East-Siberian, Mongolian, and North-Chinese birds winter in South China and Burma, occasionally straggling to Ceylon, and more frequently to the Philippine Islands and the islands of the Malay archipelago. Accidental stragglers have wandered as far as India, Australia, New Zealand, and, it is even said, to the neighbourhood of Lake Michigan in North America. The White-winged Black Tern has no nearer allies than the Whiskered and Black Terns.

The White-winged Black Tern resembles the other two Marsh-Terns so closely in its habits that a description of one almost suffices for that of the other. It does not breed so far west as the Black Tern, and is so rare a bird in Western Spain that Irby only met with it once at Gibraltar; but Krüper says that it passes through Greece on migration, in company with the Whiskered Tern, late in April. It frequents precisely the same localities as the Black Tern, and often breeds in the same colonies with its ally. Naumann says that on the wing it is more active than the Black Tern, and can easily be recognized amongst a flock of that species by its more rapid and powerful flight. Its notes are said to be very similar to those of its two allies, and, like them, it is principally an insect-feeder. Its nest resembles that of the Black Tern, and, if not built amongst a colony of that bird, is placed in a precisely similar locality in a colony apart.

The eggs of the White-winged Black Tern are usually three in number, but it is said four are occasionally laid. They are precisely similar to

those of the Black Tern, and exhibit the same variations, ranging from greyish buff to buffish brown in ground-colour, more or less heavily spotted and blotched with reddish brown and dark blackish brown. The underlying markings are pale grey. The eggs vary in length from 1·4 to 1·34 inch, and in breadth from 1·01 to ·95 inch. They vary considerably in shape, some specimens being almost as much pointed at the large as at the small end.

In its winter-quarters in South Africa the White-winged Black Tern is described by Ayres and others as frequenting lakes and swamps and avoiding the sea-coast. It is said to hawk for insects on the wing like a Swallow; but its flight is described as unsteady, slow, and heavy.

The White-winged Black Tern is about the same size as the Black Tern, but has slightly longer wings, and the fork of the tail is not quite so deep. The adult in summer plumage differs principally from that of the Black Tern in having the slate-grey on the wings shading into white on the shoulder; in having the upper tail-coverts and tail, as well as the under tail-coverts, white; whilst the rest of the plumage, including the under wing-coverts, is greenish black, shading into slate-grey on the innermost secondaries. The soft parts greatly differ, the bill being dark red, and the legs and feet scarlet, but the irides are dark hazel. After the autumn moult the mantle becomes slate-grey, the head and neck become white, marked with black on the nape, and the whole of the underparts except the under wing-coverts, which are suffused with grey, become white.

After the spring moult the young bird differs from the adult in having the lesser wing-coverts, the upper tail-coverts, and tail suffused with grey; whilst birds of the year differ from adults in winter plumage in having the wing-coverts, the innermost secondaries, and the tips of the tail-feathers with white margins and dark-brown sub-margins. Bill, legs, and feet brown.

Young in first plumage differ from birds of the year in having the feathers of the mantle, the scapulars, and the wing-coverts a darker slate-grey, with buff margins and brown sub-margins.

Young in down are pale chestnut, the upper parts mottled with blackish brown, and the underparts slightly darker on the throat.

STERNA HYBRIDA.

WHISKERED TERN.

(Plate 49.)

Sterna leucopareia, *Natt. fide Temm. Man. d'Orn.* ii. p. 746 (1820).
Sterna javanica, Sterna grisea, } *Horsf. Trans. Linn. Soc.* xiii. pp. 198, 199 (1822).
Viralva indica, Viralva leucopareia (*Natt.*), } *Steph. Shaw's Gen. Zool.* xiii. pt. i. pp. 169, 171 (1825).
Sterna hybrida, *Pall. Zoogr. Rosso-Asiat.* ii. p. 338 (1826); **et auctorum plurimorum**—(*Bonaparte*), (*Blasius*), *Schlegel*, *Finsch*, (*Salvadori*), (*Hume*), (*Legge*), (*David & Oustalet*), (*Dresser*), (*Saunders*), &c.
Sterna delamottei, *Vieill. Faun. Franç.* p. 402 (1828).
Pelodes leucopareia (*Natt.*), *Kaup, Natürl. Syst.* p. 107 (1829).
Hydrochelidon leucoparia (*Natt.*), *Brehm, Vög. Deutschl.* p. 797 (1831).
Sterna similis, *Gray & Hardw. Ill. Ind. Zool.* i. pl. 70. fig. 2 (1832).
Hydrochelidon fluviatilis, *Gould, Proc. Zool. Soc.* 1842, p. 140.
Hydrochelidon hybrida (*Pall.*), Hydrochelidon grisea (*Horsf.*), Hydrochelidon similis (*Gray & Hardw.*), Hydrochelidon javanica (*Horsf.*), Hydrochelidon indica (*Steph.*), } *Gray, Gen. B.* iii. p. 660 (1846).
Hydrochelidon delalandii, *Bonap. Compt. Rend.* xlii. p. 773 (1856).
Sterna innotata, *Beavan, Ibis*, 1868, p. 404.
Pelodes hybrida (*Pall.*), *Gurney, Anderss. B. Damara L.* p. 362 (1872).

Although the Whiskered Tern was discovered by Pallas as long ago as 1774, the misfortunes which befell that ornithologist's great work allowed Temminck to name the species six years before the 'Zoographia Rosso-Asiatica' was published, the Whiskered Tern having been rediscovered in the meantime in South Hungary by Mr. Natterer of Vienna, whose name Temminck adopted. It is the rarest of the three Marsh-Terns in the British Islands, and can only be regarded as an accidental visitor to our shores.

The first recorded example was shot late in August 1836, at Lyme-Regis in Dorsetshire (Yarrell, Brit. Birds, iii. p. 517); a second was shot in September 1839, in Dublin Bay (Thompson, 'Zoologist,' 1847, p. 1877); a third was shot on the 17th of June 1847, on Hickling Broad, in Norfolk (Gurney and Fisher, 'Zoologist,' 1847, p. 1820); a fourth was shot in August 1851, on one of the Scilly Islands (Rodd, 'Zoologist,' 1851, p. 3280); and a fifth was picked up alive, in May 1865, near Plymouth

(Gatcombe, 'Zoologist,' 1865, p. 9629). It is not known to have occurred in Scotland.

The Whiskered Tern is an inland species confined to the tropical and semitropical regions of the Old World. Its principal breeding-places in Europe are the Spanish swamps, the delta of the Rhone, and the marshes of the Upper Danube in Hungary, and of the Dnieper in South-west Russia. Further north it is an accidental visitor to Northern France, Germany, and Denmark. In North Africa it breeds more abundantly; and small colonies are to be found in Greece and Palestine. Further east it breeds on the plains of the Caucasus, in Turkestan, Cashmere, and Northern India; Prjevalsky found it breeding in the valley of the Hoang-ho in South-east Mongolia. Styan obtained it on the Yang-tsi-kiang in Central China, and Swinhoe in Formosa. Thence it ranges through the Philippines and the Malay archipelago to North-east Australia, where it breeds on the lagoons. The European birds winter in Africa, as far south as Damara Land and the Transvaal, where a few may remain to breed; and the Turkestan birds migrate in the cool season to India, as far south as Ceylon and Burma. It is probable that it is only a summer visitor to the valley of the Hoang-ho. An example is said to have been obtained in the West Indies. The Whiskered Tern has no very near ally.

The Whiskered Terns which breed in Europe cross the Mediterranean during the last half of April. In Spain this species breeds in May, but in North-west India in June and July. It is quite as gregarious as the other Marsh-Terns, and breeds in colonies, sometimes in company with them. Like its allies it frequents marshes and lakes and avoids the sea-shore, spends most of its time on the wing hawking for insects, which are its principal food, and makes a floating nest of aquatic plants. Its notes differ little from those of its allies, but its flight is described as not quite so swift. I shot a pair out of a small flock on one of the islands in the lagoon of Missolonghi, but was unsuccessful in finding the colony, though the date was the 27th of May. Canon Tristram found it breeding in Algeria, in nests of the Eared Grebe which the young had left; but in India Anderson saw it building floating nests of its own, some of which were more than a foot in diameter and four inches high.

The eggs of the Whiskered Tern are two or three in number, and vary in ground-colour from very pale greyish green to pale buff. They are somewhat sparingly spotted and blotched with dark reddish and blackish brown, and with underlying markings of pale brown and grey. The markings are rarely, if ever, so large as those on the eggs of the Black Tern (varying from the size of a pea to mere specks), and are more evenly distributed over the surface of the shell. Sometimes the spots are lengthened into short irregular streaks and scratches; whilst the underlying markings are numerous and conspicuous. The eggs vary in length from 1·65 to 1·4 inch,

and in breadth from 1·16 to 1·05 inch. The eggs of the Whiskered Tern are readily distinguished from those of the Black and White-winged Black Terns by their larger size, smaller markings, and paler and greener ground-colour. Some eggs of the Arctic Tern are almost indistinguishable from those of the Whiskered Tern; but on an average those of the former species are larger and more boldly marked. Some eggs of the Little Gull also very closely resemble those of this bird, but they also are generally much larger.

The accounts of the breeding of the Whiskered Tern in South Africa and in Australia are very unsatisfactory. It is quite possible that it does breed in both these countries, but the interest attaching to the circumstance is so great that it is to be hoped that more precise details may be published.

The Whiskered Tern is somewhat larger than the two species already described, and the fork of the tail is slightly deeper. It forms a connecting link between the Marsh-Terns and the typical Terns, having the black cap of the latter, but the black belly of the former. The adult in summer plumage differs from the Black Tern in having the chin, throat, lores, ear-coverts, and sides of the neck white; the under wing-coverts are also pure white. Bill dark red; legs and feet bright red; irides dark brown. After the autumn moult the black on the head is absent from the forehead and is mottled with white on the crown, and the whole of the underparts are pure white.

After the spring moult the young bird differs from the adult in having the lesser wing-coverts mottled with brown, and the forehead and crown with white. Birds of the year differ from adults in winter plumage in having pale margins and brown sub-margins to the scapulars, innermost secondaries, and the tips of the tail-feathers, as well as to the wing-coverts. The bill, legs, and feet are brown.

Young in first plumage differ from birds of the year in having chestnut margins and brown sub-margins to all the feathers of the upper parts, including the ear-coverts.

Young in down have the upper parts pale chestnut, mottled with black; and the underparts white, except the throat, which is brownish black.

STERNA ANGLICA.

GULL-BILLED TERN.

(Plate 47.)

Sterna nilotica, *Gmel. Syst. Nat.* i. p. 606 (1788).
Sterna anglica, *Mont. Orn. Dict. Suppl.* (1813); **et auctorum plurimorum—**
Naumann, Temminck, (Jerdon), (Dresser), (Saunders), &c.
Sterna aranea, *Wils. Am. Orn.* viii. p. 143, pl. 72. fig. 6 (1814).
Sterna affinis, *Horsf. Trans. Linn. Soc.* 1820, xiii. p. 199.
Thalasseus anglicus (*Mont.*), *Boie, Isis*, 1822, p. 563.
Viralva anglica (*Mont.*), *Steph. Shaw's Gen. Zool.* xiii. pt. i. p. 174 (1825).
Laropis anglica (*Mont.*), *Wagler, Isis*, 1832, p. 1225.
Sterna macrotarsa, *Gould, Proc. Zool. Soc.* 1837, p. 26.
Geochelidon anglica (*Mont.*), Geochelidon aranea (*Wilson*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 61 (1838).
Viralva aranea (*Wils.*), *Gould, Voy. 'Beagle,'* iii. p. 145 (1841).
Gelochelidon palustris, *Macgill. Man. Brit. B.* ii. p. 237 (1842).
Gelochelidon macrotarsa (*Gould*), *Gould, Handb. B. Austral.* ii. p. 403 (1865).

Probably no one, except a blind devotee of the Stricklandian Code, would refuse to Hasselquist the merit of having discovered the Gull-billed Tern in great numbers on the banks of the Nile. It was rediscovered half a century later almost simultaneously by Montagu in England and by Wilson in America. Montagu's example was shot by himself in Sussex, and he states that he saw two others shot in the same county. Since then nearly a score examples have been obtained in England, but it has not occurred in Scotland or Ireland. About half of these occurrences have been in spring and half in autumn; one was shot near Leeds and one near Blackpool; six have been obtained at different times in Norfolk, and seven on the south coast of England. It can only be regarded as a rare straggler on migration to the east and south coasts of England.

The breeding-range of the Gull-billed Tern extends almost round the world. It is a summer visitor to several localities in Denmark; but to the rest of Europe it must be regarded as a straggler on migration, except in Southern Spain and the basin of the Mediterranean and Black Seas. It is not known to winter in any part of Europe, but is common during that season in Africa north of the Sahara, where a few remain to breed. It is a summer visitor to the salt lakes of Turkestan, Cashmere, and South Mongolia, wintering in Persia, India, Ceylon, Burma, and throughout the Malay archipelago. It has once been obtained in South China, and a great number remain to breed in South Persia and a few in North-west India. It has been recorded from several localities in Australia, and has been said

to breed there*. In North America it is found in the breeding-season on the Atlantic coast from Massachusetts to Mexico and the West Indies, migrating in winter to the east coast of South America, as far south as Northern Patagonia. The only record of its occurrence on the Pacific coast of America is in Guatemala, most probably that of a bird which had wandered across the isthmus.

The Gull-billed Tern is very fond of salt water, but is more partial to the lagoons and deltas, where it is protected from heavy seas, than to outlying islands or the open coast. It prefers salt lakes to freshwater lakes, though it is often found on the latter, as well as on large rivers; but it avoids the swamps and marshes, which are so attractive to the Black Tern and its allies. The Gull-billed Tern arrives at its breeding-grounds in the south of Europe about the middle of April, and has been known to have eggs in Greece by the end of that month; but in Denmark it breeds nearly a month later. It leaves its northerly breeding-grounds early in September.

My first introduction to the Gull-billed Tern was in the middle of June 1872. Dr. Krüper and I had just returned from an excursion into the mountains of Asia Minor, and were stopping in Smyrna to narrate our adventures to our mutual friend Guido von Gonzenbach. Our host excited our curiosity by an account of his visit to a colony of Gull-billed Terns and other sea-birds, and was kind enough to introduce us to the sailor who had piloted him to it thirteen years previously. He was a Greek, but nevertheless occasionally spoke the truth when it was made worth his while, and ordered us to be ready to sail at ten o'clock that night. The evening was cloudy, and there was more wind than usual; it was very dark when we stepped off the quay into the caique, but we hoistsd a sail, and were soon scudding before the wind in the gulf. For six miles or so we had smooth water, with a stiff breeze, and soon reached the straits. The boatmen peered anxiously into the darkness, and finally decided that it was not safe to risk the caique in such a heavy sea, so we dropped anchor near the south promontory under the shelter of the Turkish barracks. It was too dark to see the building, but we watched the two lighthouses on either coast, and freely criticized the carelessness of the lighthousemen, who several times almost allowed their lights to go out. We lay at anchor in this outlandish place for four hours, flip-flopping on the restless waves. Our two boatmen were soon fast asleep; Krüper and his Greek servant followed suit; I alone was obliged to keep lonely midnight watch, compelled by stern fate to pour out repeated liba-

* Australian examples are slightly paler in colour than those found elsewhere, and may prove to be subspecifically distinct, in which case they must bear the name of *Sterna anglica macrotarsa*.

tions to Neptune. At four o'clock day began to dawn, the Greeks yawned, weighed anchor, rowed through the straits into the now quiet sea, hoisted sail, and for half an hour we ran gaily along the coast, in the glorious morning sun, in the best of spirits, "with youth on the prow, and pleasure at the helm." But alas for the briefness of human happiness! At the end of half an hour the next worst thing to a storm befell us, namely a calm. The sails flapped idly against the mast and we were obliged to take to the oars. There was just enough sea on to make rowing hard work, and we were lamenting our adverse fate, when a breeze once more wooed our sails, we made five-and-twenty knots in three hours, and entered a lagoon, shut off from the main sea by a range of long flat islands, scarcely rising six inches above the level of the blue water. These islands were the seat of a trade by no means unimportant in the East, the manufacture of salt, a monopoly of the Imperial Ottoman Government. Long before we neared the shore, we could see pyramids of salt, mountains of salt as high as a house. Large pools on these flat islands are flooded with salt water, which soon evaporates under the broiling sun, leaving the salt behind, which is afterwards dug out and piled up into a mountain. We landed on a wooden pier, a few slender boards supported by piles, glad to reach *terra firma* again.

I had not sufficiently recovered from my midnight occupation to do more than nibble a biscuit for breakfast, but a café turque and a pull at a nargilleh revived me. We got into a flat-bottomed boat manned with Greeks armed with long forked poles, with which they pushed us along, the water in the lagoon being scarcely a foot deep. A flock of Lesser Terns which frequented the salt islands gave a tone to my system; a few Common Terns, a Caspian Tern, and a Pelican hove in sight—I felt equal to a sandwich! and when we landed on one of the large islands in the middle of the lagoon, with scores of Pratincoles pretending to be wounded on the ground at our feet, and hundreds of Gull-billed Terns flying wildly over our heads, my sea-sickness and sleepless night were completely forgotten. There were two large islands in the middle of the lagoon and several smaller ones. The one on which we landed was scarcely six inches above the level of the sea, and was full of large tracts of cracked mud, between which patches of the usual short marine vegetation were conspicuous on a sandy ground. We soon found plenty of eggs of the Gull-billed Tern; the nests were not very close to each other, but they were all in one part of the island; the eggs were on the sand, never on the black mud; some were lying in slight natural hollows between the patches of vegetation on the bare sand, without any attempt at a nest, but generally a slight hollow was scratched in the earth or sand, and a few bits of seaweed or dead grass frequently formed an apology for a nest. The most common number of eggs in each nest was two; three was not

uncommon, but we never found four in one clutch. After taking a few nests of the Pratincole we returned to the salt islands and found the Kentish Plover and Lesser Tern breeding on the sandy beach of the sea-shore. Soon after noon we left again for Smyrna; a stiff breeze was blowing, and the sea was rather heavy, but, in spite of our being compelled by the direction of the wind to make a long tack, we did our forty miles in four hours and a half. I was, of course, dreadfully sick in the open gulf, but after we passed the straits slept soundly from utter fatigue.

In the following spring I spent a week amongst the Gull-billed Terns in the lagoon of Missolonghi, where this bird was equally common on similar low, flat islands. I took thirty eggs on the 29th of May, and might have taken more if they had been required.

The eggs of the Gull-billed Tern vary in ground-colour from buffish white to buffish brown, with occasionally a very slight tinge of olive. The spots are never very large, rarely as big as a pea; the surface-markings are brown, and the underlying ones, which are always very conspicuous, are grey. Occasionally the spots are most numerous round the larger end of the egg, but they are generally evenly and sparingly distributed over the whole surface. The eggs vary in length from 2·1 to 1·8 inch, and in breadth from 1·5 to 1·3 inch. Small eggs of the Sandwich Tern might sometimes be mistaken for eggs of the Gull-billed Tern; but the latter are almost always much duller in colour.

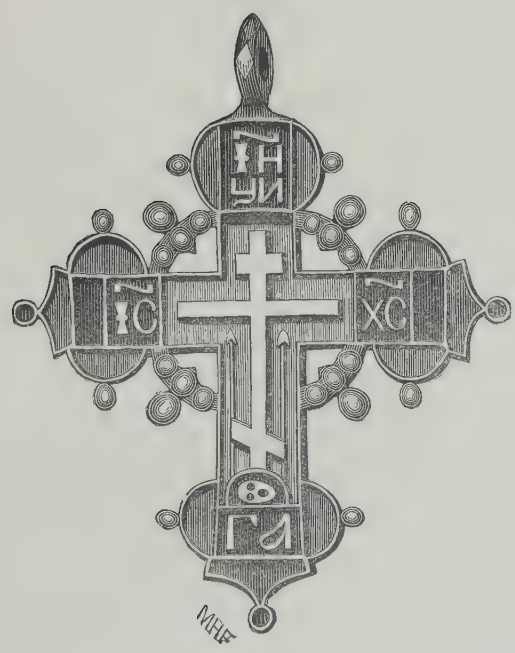
The Gull-billed Tern utters a variety of notes, some of them Tern-like and others more Gull-like. In Greece and Asia Minor at its breeding-colonies its note reminded me of the laugh of the Herring-Gull, and might be represented by the syllables *ef, ef, ef,* or *af, af, af*; but in the Black Sea, as these birds flew over our boat, they called to each other *kăy-vĕk, kăy-vĕk*. Legge likens its call-note during summer in Ceylon to the syllables *chē-āh*; and Irby, speaking of its habits in Algeria, represents its note as *kŭk-wŭk*. Naumann was only acquainted with the laugh, which he gives as *hăy-hăy-hăy*.

The Gull-billed Tern is almost omnivorous in its diet. Mr. Young and I watched a flock of these birds, not far from one of the lagoons in the Dobrudscha, hawking like Swallows or Bee-eaters over a field of standing corn, apparently catching dragon-flies. Other observers have seen it catching grasshoppers and locusts on the wing; and Naumann says that it follows the plough to pick up worms and grubs, seizes small fish, tadpoles, and beetles (though it only plunges its head into the water), and that the remains of small birds' eggs and nestlings have been found in its stomach.

The Gull-billed Tern is intermediate in size between the Sandwich Tern and the Common Tern, but the tail has not such a deep fork (nearly $1\frac{1}{2}$

inch). The general colour of its plumage and the successive changes which it undergoes are typical of the group to which the Arctic Tern belongs; but in this species the dark bar across the lesser wing-coverts in the immature bird is absent, and the head of the adult after the autumn moult is white, with grey and black streaks which extend to the upper ear-coverts. Bill black; legs and feet reddish black; irides hazel.

Young in down have the upper parts pale buff, mottled with dark grey, and the underparts dull white.



STERNA CASPIA.

CASPIAN TERN.

(Plate 47.)

Sterna tschegrava, *Lepech. Nov. Comm. Petrop.* xiv. p. 500 (1770).
Sterna caspia, *Pall. Nov. Comm. Petrop.* xiv. p. 582 (1769); **et auctorum plurimorum**—*Naumann, Temminck, Degland & Gerbe, Dresser, Saunders,* &c.
Sterna caspica, *Sparrm. Mus. Carls.* ii. fasc. 3, no. 62 (1788).
Sterna megarhynchos, *Meyer, Taschenb.* ii. p. 457 (1810).
Thalasseus caspius (*Pall.*), *Boie, Isis,* 1822, p. 563.
Hydroprogne caspia (*Pall.*), *Kaup, Natürl. Syst.* p. 91 (1829).
Sylochelidon caspia (*Pall.*), *Brehm, Vög. Deutschl.* p. 770 (1831).
Helopus caspius (*Pall.*), *Wagl. Isis,* 1832, p. 1224.
Thalassites melanotis, *Swains. B. W. Afr.* ii. p. 253 (1837).
Sylochelidon strenuus, *Gould, Proc. Zool. Soc.* 1846, p. 21.
Sylochelidon melanotis (*Swains.*), *Bonap. Compt. Rend.* xlii. p. 772 (1856).
Sterna melanotis (*Swains.*), *Hartl. Orn. Westafr.* p. 254 (1857).

The Caspian Tern appears to have been unknown to Linnæus or Brisson, but at the date when the works of these ornithologists were published it is probable that Messerschmidt had already discovered this handsome bird. Three years after the publication of the twelfth edition of the great work of Linnæus it was described for the first time by Lepechin, a Russian traveller, who adopted as a specific term the local name by which it was known to the Russians living on the shores of the Caspian Sea, where it was first discovered.

It is not known to have occurred in Scotland or Ireland, and to England it is a rare straggler on migration. The earliest record of its occurrence is that of one killed at Yarmouth in October 1825, and of a second shot about the same date near Caistor, in the same county (Paget and Hunt, Nat. Hist. Yarmouth, p. 12). Since that date six examples have been shot in that county and two or three others have been seen. Examples have also been obtained on the coasts of Suffolk (Jenyns, Brit. Vert. p. 265), in Hampshire (Gurney, 'Zoologist,' 1869, p. 1512), and in Lincolnshire (Footit, 'Zoologist,' 1853, p. 3946). No one appears to have taken the trouble to verify the alleged occurrence of this bird at Filey (Clarke, Handb. Vert. Faun. Yorks. p. 80).

The geographical range of the Caspian Tern, like that of the Gull-billed Tern, extends round the world. In Europe the Caspian Tern breeds on the shores of the Mediterranean and Black Seas, on the Spanish coast, on the island of Sylt, and in various localities in the basin of the Baltic. It frequents the entire coasts of Africa, breeding in the deltas of the Nile and the Zambesi. It also breeds on the islands in the Persian Gulf

and the Caspian Sea, and in the salt lakes of Turkestan. It is found in various parts of India, and breeds in Ceylon. It is common in Burma and China, but its breeding-places in those countries have not been discovered. It is a resident in Australia and New Zealand. In America its range appears to extend much further north than in the eastern hemisphere, for it has occurred from Alaska to Labrador, and southwards to California, North Mexico, and Florida.

In tropical and subtropical America the Caspian Tern is replaced by a smaller but distinct species, *Sterna maxima*, which frequently visits the west coast of Africa as far north as Gibraltar. This species may be distinguished by having the outer portion of the inner webs of the first six primaries white.

The Caspian Tern is almost cosmopolitan in its distribution, except that it rarely wanders far from the sea-coasts, and seldom or never strays into the Arctic regions. With such an immense range it is not to be wondered at that its habits should be subject to some variation. In the breeding-season it is a very gregarious bird, and is seldom seen far from the coast, though it prefers to fish in the quiet lagoons rather than in the open sea. Its flight is very powerful, though somewhat more heavy than that of the smaller Terns, but it appears to live quite as much in the air. In India, Australia, and New Zealand it is represented as feeding singly or in pairs; but in the lagoons of the Black Sea I have always seen it in flocks, frequently in the company of Cormorants. In many places it is said to breed in isolated pairs, but there can be little doubt that it generally breeds in colonies. In the lagoons near the delta of the Danube it breeds in enormous numbers, though of late years its eggs have been so persistently robbed by the Russian fishermen that it has almost deserted the best known locality. When I visited Lake Sinoe, where a large colony has existed for the last fifty years, only a few pairs were breeding on the islands. The colony on the Island of Sylt, off the coast of Denmark, consisted, ten years ago, of about five-and-twenty pairs (Durnford, 'Ibis,' 1874, p. 401). In 1819, when Naumann and Boie visited it, they estimated the number at three hundred pairs, and were assured by the inhabitants that the birds had formerly been much more numerous. The nests are exactly like those of the Sandwich Tern—mere depressions in the sand, with occasionally a little seaweed or dead grass placed round the edge. At the nest the birds are very noisy. The cries are loud and harsh; if the bird is not very alarmed they sound like *kay-owk*, but when it is excited the note is more rapidly repeated and sounds like *kowk*. The Caspian Tern feeds almost exclusively on fish, hovering over the water and dropping down on its prey with a great splash; but Naumann states that it is almost as great a robber as the Gulls. He says that not only Brehm, but other ornithologists have found the remains of eggs and young birds in its stomach.

My friend Mr. Johnson, who visited the colony on Sylt in 1871, writes to me as follows :—

"We started early on the 1st of June from the little village of List and arrived at the lighthouse on the Elbow, as the most northerly part of the island is called, about half-past eleven. Long before we reached the colony, which surrounds the remains of an old wreck lying high and dry on the sand, the birds began to hover and scream over us. We saw seventeen nests, if a mere indentation in the sand may be called a nest, containing from one to three eggs each, all apparently quite fresh. The birds were extremely bold and noisy; they rose in the air to a great height, when some separated from the main body and came dashing down to within ten or twelve feet of our heads, angrily screaming all the time, and then returned to the main flock, which continued to scream and to fly over our heads whilst we remained near the eggs."

It is not known that the Caspian Tern ever lays more than three eggs. They vary in ground-colour from buffish white to buffish brown; the surface-markings, never very large, are brown, and the underlying markings, always very conspicuous, are grey. Occasionally most of the spots are round the large end of the egg, but generally they are distributed over the whole surface. The eggs vary in length from 2·7 to 2·4 inch, and in breadth from 1·8 to 1·7 inch. They resemble very closely in colour those of the Gull-billed Tern, but are always much larger.

Hume, describing the habits of the Caspian Tern in Scind, remarks :— "I have counted more than fifty on the wing at the same time, each bird flying separately on his own responsibility, and never, so far as I have noticed, associated in flocks or parties as is so often the case with the other Terns and Gulls. The local name is *Keykra*, which does approximately (at any rate when pronounced by the native fishermen) represent the harsh cry of this species. Usually, when not interfered with, this species may be distinguished at a great distance by its long pointed bill turned downwards at right angles to the body."

The Caspian Tern is the largest of the British Terns, and is a heavier bird than a Common Gull, but the tail has not a very deep fork (about $1\frac{3}{4}$ inch). This species in each of its various stages of plumage scarcely differs from the corresponding plumages of the group of Terns of which the Arctic Tern is a typical example, except that the forehead is never white, but always of the same colour as the crown. Bill scarlet, with a black tip, in the adult in breeding-plumage; orange, with more black at the tip, in winter plumage; and yellowish brown, darker at the tip, in the immature birds. Legs and feet black in the adult, brown in the young; irides hazel.

Young in down have the upper parts greyish white, mottled with grey, and the underparts dull white.

An example of Rüppell's Tern, frequently called the Swift Tern (*Sterna bergii*), was recorded by Thompson, under the name of *Sterna velox* ('Zoologist,' 1847, p. 1878), as having been killed near Dublin in December 1846. This example has since been ascertained to have been a foreign skin in full breeding-plumage purchased from a dealer. It is a tropical species, ranging from the Red Sea and the Cape of Good Hope eastwards throughout the Indian Ocean, the Malay archipelago, and the China seas, down to Australia and the Fiji Islands. Its egg is figured on Plate 47.

STERNA CANTIACA.

SANDWICH TERN.

(Plate 48.)

Sterna sandvicensis, *Lath. Gen. Syn. Suppl.* i. p. 296 (1787).
Sterna africana, *Gmel. Syst. Nat.* i. p. 605 (1788).
Sterna cantiaca, *Gmel. Syst. Nat.* i. p. 606 (1788); et auctorum plurimorum—*Naumann, Temminck, Degland & Gerbe, Dresser, Saunders,* &c.
Sterna boysii, *Lath. Ind. Orn.* ii. p. 806 (1790).
Sterna stubberica, *Bechst. Naturg. Deutschl.* iv. p. 679 (1809).
Sterna canescens, *Meyer, Taschenb.* ii. p. 458 (1810).
Thalasseus cantiacus (*Gmel.*), *Boie, Isis,* 1822, p. 563.
Actochelidon cantiacus (*Gmel.*), *Kaup, Natürl. Syst.* p. 31 (1829).
Sterna acuflavida, *Cabot, Proc. Bost. Soc.* ii. p. 257 (1847).
Thalasseus acuflavidus (*Cab.*), *Coues, Proc. Phil. Acad.* 1862, p. 540.

The Sandwich Tern was first discovered at Sandwich, on the coast of Kent, by "that diligent naturalist Mr. Boys," who sent examples to Latham in 1784 (Lath. Gen. Syn. iii. p. 357). Latham appears to have acknowledged its specific identity with an immature example from South America in the Leverian Museum, and to have suspected that another immature example from Africa in the British Museum might also belong to the same species.

Since the days of Latham the Sandwich Tern has been found to be a regular summer visitor to many parts of the British Islands. It no longer breeds on the coast of Essex or Kent, but it is still found in some numbers on the Farne Islands off the Northumberland coast, and there is a small colony on the coast of Cumberland. A few pairs breed on Walney Island in Lancashire and on the Scilly Islands. In Scotland the breeding-places of this handsome bird have fared no better. It is carefully preserved on Loch Lomond, and is said still to breed in the Firth of Tay and in Sutherlandshire and some other places on the west coast. In Ireland it breeds in County Mayo, and possibly on some other parts of the west coast.

The Sandwich Tern must be regarded as an Atlantic species. It is a summer visitor to Europe as far north as Denmark, on the west coast of which it breeds in considerable numbers. To the southern Baltic it is an accidental visitor, and is only seen on migration on the French coast. In the Mediterranean it is principally known as passing through on migration, but a few remain to breed on the Spanish coast and elsewhere. It is a common summer visitor to the shores and islands of the Black Sea, as well as to those of the Caspian, which appears to be the eastern limit of its

breeding-range. The European birds winter on the southern shores of the Mediterranean, and throughout West Africa down to the Cape. It is not known to breed in Africa, but is said to be a resident in the Canaries. The birds breeding on the islands in the Caspian appear to winter on the coasts of Arabia, South Persia, and Scind, but it is not known that they visit the east coast of Africa. On the American continent the Sandwich Tern breeds on the coasts of all the Atlantic States, and in Central America as far south as Honduras; it winters on the Atlantic coasts of South America as far south as Bahia, and crosses the Isthmus to the Pacific coast of Guatemala. Messrs. Baird, Brewer, and Ridgway regard the American Sandwich Terns as subspecifically distinct from those of the Old World; they state that in American examples the white margin of the inner web of the outer primaries does not reach to the tips of the feathers, as it does in newly moulted adult European birds. The primaries of immature birds and of those in abraded plumage from the Old World resemble American examples in this respect. If these differences prove to be constant, the American Sandwich Tern must bear the name of *Sterna cantiaca acuflavida*.

As may be inferred from its range, the Sandwich Tern is preeminently a sea-bird and is rarely seen inland. Few birds rival it in its power of rapid or sustained flight. Like the Swallow, it almost lives in the air; but instead of hawking like that bird and the Marsh-Terns in pursuit of insects, it fishes for its food in the water, hovering over the surface for a moment like a Kestrel, and suddenly dropping down on a fish like an Osprey or a Kingfisher. Even storms do not drive it inland; and it is especially fond of seeking its prey amongst the breakers, where the angry waves and the shallow water put the fishes at its mercy. It is a wild and wary bird, and to study its habits it must be sought at its nesting-colonies.

To any one anxious to learn something of the breeding-habits of sea-birds, I know of no place more interesting than the Farne Islands. They lie about five miles off the coast of Northumberland, and may easily be reached in a fishing-boat from Bamborough or North Sunderland. I have visited them repeatedly during the last twenty years, and on each visit have been more charmed than before. The first half of June is the best time of the year; and to give the reader an idea of the riches of the locality, I copy from my journal the list of eggs taken on the 19th of June, 1870:—

Sandwich Tern	149
Common Tern	13
Arctic Tern	40
Lesser Black-backed Gull	56
Carried forward	258

Brought forward	258
Herring-Gull	4
Kittiwake	17
Oyster-catcher	8
Ringed Plover	8
Guillemot	56
Cormorant	83
Puffin	16
Eider Duck	6
	456

The Sandwich Terns were so abundant at that time that it was impossible to walk across the colony without treading on their eggs. I only took exceptionally handsome eggs, and after I had made my selection the numbers left in the nests (if nests they may be called) were not perceptibly lessened. The Sandwich Tern arrives at the Farne Islands about the middle of April to reconnoitre its breeding-grounds: every morning the birds pay an early visit to the islands, before they disappear to feed; as the time when they begin to lay approaches, they lengthen their stay; until, about a month after their arrival, they have finally decided on a site for the colony, when they take up their permanent abode on the islands for the season and the first eggs are laid. This usually happens about the middle of May, a week earlier or a week later, according to the season. They generally choose the spot where they bred in the previous year; but if the nests are repeatedly robbed and cleared of all their eggs (which, I regret to say, occasionally used to happen, especially on misty mornings when the thieves were concealed by the fog), the birds desert their colony and found a new one on another island. Occasionally a small colony is found at a distance from the main one, perhaps on the next island. On my first visit to the Farne Islands, in company with Mr. Charles Doncaster, we found three or four nests of the Sandwich Tern on an island called the Wide Opens; they were the most flimsy structures possible, placed on the short grass between the masses of bladder campion, which covered a great part of the island, almost down to high-water mark of spring-tides. We were much disappointed to find so small a colony; but Cuthbertson, our guide, advised us to try the next island, which could easily be reached on foot by traversing a long shingly beach which was exposed at low water. So we trudged along patiently and laboriously over the loose stones until we reached it, and suddenly found ourselves in a perfect little Eldorado. On a gently sloping sand-bank leading up to the centre of the island, which was merely a mass of shelving rock, perhaps thirty feet across, there was a large colony of the Sandwich Tern. The

nests were merely slight hollows in the bare sand, in diameter and depth of the dimensions of a cheese-plate, and they and their contents were so difficult to distinguish from the sand and fine gravel, that my first discovery of the colony was to find that I had "put my foot in it," and broken a Sandwich Tern's egg. In the thick of them there must have been on an average a nest per square yard. The birds, which were not then sitting (it was the 3rd of June), soon discovered that their colony was being invaded, and flew in hundreds over us for a short time. In a quarter of an hour we found the nest of an Eider Duck containing eggs, several nests containing eggs of the Lesser Black-backed Gull, a Ringed Plover's nest containing four eggs, two Oyster-catcher's nests (one with three and the other with four eggs), a dozen eggs of the Arctic Tern, and we certainly saw more than two hundred eggs of the Sandwich Tern.

In the year when I found them in still greater abundance they had chosen the same locality for their colony; but they were so much molested that they soon deserted the place, and moved their quarters to the grass-covered island adjoining, where their eggs were in such profusion that we inadvertently trod on many of them. In this locality many of the birds had arranged the scattered bits of dead weed which were lying about into the semblance of a nest. In addition to the *krr-ee*, which seems, in a more or less modified form, to be common to all the Terns, the Sandwich Tern has a note which may be represented by the syllables *skerr-rek*. Although this Tern is preeminently a salt-water species, and generally breeds on outlying islands at some distance from the shore, it does not always do so. In 1819 Naumann visited a colony on the island of Norderog, off the coast of Schleswig, and estimated the numbers of Sandwich Terns breeding there at upwards of half a million; but on the west shores of the Black Sea I have taken eggs from a small colony on an island in a lagoon some distance inland, and my friend Mr. Warren found a small colony in County Mayo, on an island in a moorland tarn some miles from the sea and quite unconnected with it ('Zoologist,' 1877, p. 101).

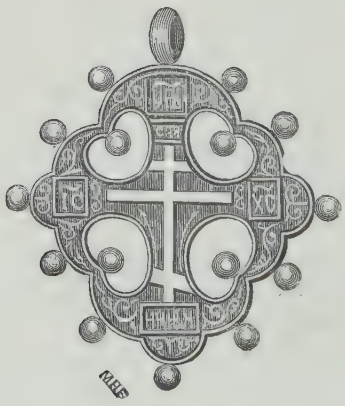
The eggs of the Sandwich Tern are remarkably handsome, and are unrivalled in the boldness of the markings which they occasionally display. The ground-colour varies from pure white to brownish buff; the commonest colour is creamy white, and the rarest white with a slight tinge of olive. The colour of the surface-spots is dark brown, frequently approaching black, whilst the underlying markings, which are generally very conspicuous, are pale slate-grey. The size, shape, and distribution of the spots present almost endless variations. In some of the handsomest eggs a fantastically shaped spot covers a third of the visible surface, and occasionally eggs are met with in which the spots are delicate though short streaks. They vary in length from 2·3 to 1·9 inch, and in breadth from 1·5 to 1·3 inch. The eggs of the Sandwich Tern are not easily confused

with those of any other British bird. If its eggs are taken, which in many places is systematically done, it lays again and again, but otherwise it only rears one brood in the year.

They commence to leave their colonies in the North Sea about the middle of August, and by the middle of September their breeding-places are deserted. In their winter-quarters on the west coast of Africa they are said to confine themselves to the vicinity of the sea-shore.

The Sandwich Tern is slightly larger than the Gull-billed Tern, but the fork of the tail is nearly twice as deep (about $2\frac{1}{2}$ inches). The upper tail-coverts and the tail are white, and the white margins on the inner webs of the quills extend to the point; otherwise in the general colour of its plumage, and in the successive changes which it undergoes, it agrees with the group of which the Arctic Tern is typical. Bill black, with a yellow tip in the adult, paler in the young. Legs and feet black in the adult, brown in the young; irides hazel.

Young in down have the upper parts pale grey mottled with greyish black, and the underparts pure white.



STERNA DOUGALLI.

ROSEATE TERN.

(Plate 46.)

Sterna dougalli, *Mont. Orn. Dict. Suppl.* (1813); **et auctorum plurimorum—**
Temminck, Naumann, Degland & Gerbe, Dresser, Saunders, &c.
Thalassæa dougalli (*Mont.*), *Kaup, Natürl. Syst.* p. 97 (1829).
Sterna paradisea, *Keys. u. Blas. Wirb. Eur.* p. xcvii (1840, *nec Brünn.*).
Sterna macdougalli, *Macgill. Man. Brit. B.* ii. p. 233 (1840).
Hydrocecropis dougallii (*Mont.*), *Boie, Isis,* 1844, p. 179.
Sterna gracilis, *Gould, Proc. Zool. Soc.* 1847, p. 222.
Sterna douglasii, *Schl. Mus. Pays-Bas, Sternæ,* p. 24 (1863).
Sterna korustes, *Hume, Stray Feath.* ii. p. 318 (1874).

The Roseate Tern is one of several species of birds which were first introduced to ornithologists by Colonel Montagu, who described and figured it in the Supplement to his 'Ornithological Dictionary,' about seventy years ago, and very properly named it after its discoverer. Dr. MacDougall of Glasgow found several of these beautiful birds, in company with great numbers of Common Terns, which were breeding on "two small flat rocky islands in the Firth of Clyde called Cumbrae Islands," and sent a skin and many interesting particulars respecting the peculiarities and habits of the new species to Colonel Montagu.

It is doubtful whether the Roseate Tern breeds in any part of the British Islands at the present time; but after attention had been directed to it by Montagu, it was found breeding on several islands off the Scotch and Irish coasts, on Foulney and Walney Islands off the coast of Lancashire, on the Farne Islands, and on the Scilly Islands. It is to be feared that all these stations are now deserted; but the bird has occurred on the Farne Islands and on the Norfolk coast as recently as 1880.

The Roseate Tern may be regarded as an inhabitant of the Atlantic and the Indian Oceans. It breeds on the shores of the American continent, from Massachusetts to Florida, and on the Bermuda Islands. It has also been found in the West Indies and in Central America, and may probably breed there. It is said to have occurred on the Azores. It may still breed sparingly on the west coast of Denmark, and certainly does so on some of the islands off the north-west coast of France. It can only be regarded as a rare straggler to the Mediterranean, and has not yet occurred on the west coast of Africa; but on the east coast it has been found at the Cape, in Natal, and on the Island of Rodriguez. It is occasionally found on the coasts

of India, and breeds on the shores of Ceylon and the Andaman Islands. It has been obtained in Burma, and eastwards its breeding-range extends to the Malay archipelago, Western and North-eastern Australia, and New Caledonia.

In New Zealand the Roseate Tern is represented by a somewhat nearly allied species, *Sterna frontalis*, which is a larger bird and has a white frontal band.

It is not often that the Roseate Tern approaches near enough to the observer for its black bill to be distinguishable, but it may generally be recognized by its short wings and long tail. Very little is known of its habits, but it is said to be almost exclusively a sea-coast bird. Naumann says that its call-note (*krr-ee*) resembles that of the Common Tern much more than it does that of the Arctic Tern. Of its alarm-note nothing appears to be recorded beyond the statement of Capt. Legge that it is "a monosyllabic and not unmusical piping note." It feeds upon fish, which it catches in the same way as its allies, sometimes swooping gracefully down upon its prey, at others dropping upon them like a falling stone.

Like its congeners, it makes no nest, but lays its eggs in a slight depression in the sand, sometimes placing a few roots or bits of dead grass round them.

The eggs of the Roseate Tern are two or three in number, and are similar in colour to those of the Common Tern. They vary in length from 1·75 to 1·55 inch, and in breadth from 1·25 to 1·1 inch. It is impossible to give any characters by which the eggs of this species can be distinguished from those of the Common and Arctic Terns.

There are many large colonies of the Roseate Tern on various islands off the Atlantic coasts of the United States. One of the most important of these is on Faulkner's Island, in Long-Island Sound, not many miles from New York. Brewer (Water-Birds of N. Amer. ii. p. 306) gives some very interesting notes of the habits of the birds at this locality. They make their first appearance about the middle of May, and begin to lay on the 1st of June. Some make only a slight hollow in the sand, others deposit their eggs on the stones, whilst a few collect a little dry grass and seaweed. Four eggs are occasionally found in the nest; but where that is the case one differs from the others, and is probably laid by a second female. The male feeds its mate whilst she is sitting. During June a hundred eggs or more are taken each day, but only on the outskirts of the colony. The young are able to fly by the 20th of August, and when fish, which appears to be their sole food, is plentiful they remain till the 1st of October.

The Roseate Tern is about the size of a Common Tern, but has a shorter wing; the fork of the tail is generally much deeper (varying from $3\frac{1}{4}$ to

5½ inches). In the general colour of its plumage and the various changes which it undergoes it closely resembles the group to which the Arctic Tern belongs, except that in the adult the underparts are often suffused with a roseate tinge. Bill black, red at the base; legs and feet pale vermilion; irides hazel.

Young in down of the Roseate Tern have the upper parts buff mottled with white and grey, and the underparts pure white.

STERNA HIRUNDO.

COMMON TERN.

(Plate 46.)

Sterna major, *Briss. Orn.* vi. p. 203 (1760).
Sterna hirundo, *Linn. Syst. Nat.* i. p. 227 (1766, partim); **et auctorum plurimorum**—*Temminck, Degland & Gerbe, Baird, Brewer, & Ridgway,* &c. (*nec Dresser*).
Larus bicolor,
Larus sterna,
Larus columbinus, } *Scop. Ann. I. Hist. Nat.* pp. 81, 82, 83 (1769).
Sterna fluviatilis, *Naumann, Isis,* 1819, p. 1847.
Sterna senegalensis, *Swains. B. W. Afr.* ii. p. 250 (1837).
Sterna wilsoni, *Bonap. Comp. List B. Eur. & N. Amer.* p. 61 (1838).
Hydrocecropis hirundo (*Linn.*), *Boie, Isis,* 1844, p. 179.
Sterna chelidon, *Licht. Nomencl. Av.* p. 97 (1854).
Sterna macrodactyla,
Sterna macroptera, } *Blasius, Journ. Orn.* 1866, pp. 75, 76.

Next to the Arctic Tern, the Common Tern is perhaps the best-known British species, although it is, especially in the north, much less abundant. In the Shetlands it is replaced by the Arctic Tern; but scattered colonies are found in suitable situations from the Orkneys, along the coast of Sutherlandshire, down to the Lancashire coast on the west, including the Hebrides, and down to the Farne Islands in the east. In all these localities the Arctic Tern is, however, the most abundant species, but south of these limits the Common Tern becomes more plentiful. It breeds sparingly in suitable places round the coasts of England and Wales, but is much rarer on the Channel and Scilly Islands. In Ireland the Common Tern appears to be the most abundant, and breeds in suitable situations round the coast, as well as on some of the inland lakes.

Like the Arctic Tern, the Common Tern is an Atlantic Ocean bird, but does not range as far north as the Arctic circle. On the American coast its breeding-range extends from Labrador to the Bermudas, and probably to Texas and Florida. In winter it is found from the Southern States down to Bahia, on the Atlantic coast of South America. It breeds as far north and west as the Great-Bear Lake, but it has not been recorded from the Pacific coast. In the Old World it breeds on the eastern shores of the Atlantic from the Arctic circle to the Mediterranean, but is not found in Iceland or the Faroes, although it breeds on the Azores, Madeira, and the Canaries. Inland it breeds on the shores of the large rivers and lakes, on

the European coast of the Mediterranean, and possibly in Egypt. It is a summer visitor to the shores of the Black Sea, the Caspian, and the lakes and rivers of Southern Siberia as far east as Lake Baikal and Central China, and as far south as Turkestan and Cashmere. In the valley of the Obb it breeds as far north as lat. 64°; but in the valley of the Yenesay, and throughout Eastern Siberia, it is represented by a nearly allied species, *Sterna longipennis*, which winters in Japan and China, and differs in having a black bill and brown legs and feet, longer wings and darker underparts. The Common Terns east of the Caspian have been separated by Saunders under the name of *S. tibetana*: they are said to be somewhat darker in colour, and to have on an average smaller bills and feet, but it is very doubtful if they are specifically distinct. The winter range of the Common Tern probably includes the whole of the coasts of Africa, the Mekran coast, and India as far south as Ceylon; it is not known to have occurred in Burma.

The Common Tern arrives at its breeding-places in the Azores by the middle of April. It is said to pass Sicily, commonly on migration, in May, and is one of the earliest Terns to arrive in Greece. It makes its appearance in Asia Minor at the end of April. In Holland it arrives in May, and is first seen on the British coasts during the last half of April or early in May. The birds that breed in our islands congregate into large flocks towards the end of July, and slowly wend their way south during August, September, and October. It is said to leave Holland in September, and the middle of that month is the date of its departure from the Azores and Greece.

Soon after its arrival the Common Tern retires to those parts of the coast and the adjoining islands where it rears its young. It loves to make its colony on low-lying islands and rocks at a distance from the shore, where it is comparatively free from danger. It often visits inland sheets of water, and it is very fond of following the course of large rivers. It may often be observed fishing in the shallow water of estuaries or in quiet bays. Few sights are more charming than a flock of these Terns feeding in a quiet loch. When a shoal of fry is discovered, the graceful birds hover above it in a confused, net-like, ever-moving mass, first one and then another swooping down to the surface of the water to catch a tiny fish, or more often plunging headlong down with a splash like a Gannet or a Kingfisher. As the shoal passes on, the Terns follow in its wake, ever and anon swooping down to capture the fish nearest to the surface. Sometimes this beautiful bird attends the fishing-boats, hovering, screaming in the air, and darting down to catch the small fish that are thrown overboard, often securing them before they reach the water. The Common Tern never dives; it often plunges into the water like an Osprey, and occasionally it swims a short distance, or alights on the water to rest

or sleep. Its short legs prevent it from walking very well; and it is rarely seen on the ground except at its nest or when feeding its young. Its true province is the air, and in power of wing and gracefulness of motion it yields the palm to few if any other birds. The Terns have not inaptly been termed "Sea-Swallows;" but their flight is very different from that of the Swallow, and is without its impetuous dash. They have long, pointed wings and a delicately forked tail; but they fly along in a rather slow and easy manner, putting the observer in mind of a Gull. Sometimes, however, they skim along with great speed, turn, twist, and poise with wonderful grace, and often hover above the bright blue water like large animated snowflakes. Perhaps their powers of flight are seen to best advantage when two birds are toying with each other in the pairing-season, or are engaged in battle royal for the possession of a little fish. Their erratic actions are accompanied by their peculiar cries, which serve to increase the interest of their movements. Although so well adapted for an aerial life, the Common Tern does not fly much in stormy weather; and Macgillivray says that it often shelters from the elements by lying on the shore, which it frequently does when gorged with food.

The food of the Common Tern is principally composed of fry, sand-eels, crustaceans, and small fish, which are almost exclusively captured on the wing; and sometimes the bird may be seen perched on the old piles in harbours and sea-locks, every now and then leaving its station to swoop down to the water and capture a sand-eel or a small fish. The note of the Common Tern, when it is alarmed for the safety of its eggs, is an angry *kik*, sometimes repeated two or three times. Its ordinary call-note is a long-drawn *kr-r-ee-e*.

One of the most important breeding-stations of the Common Tern in the United Kingdom is the Farne Islands. It arrives at its old summer-quarters during the last half of April, coming for a short time every morning, remaining longer at each successive visit until it commences to breed. The eggs are laid during the first half of June, about a fortnight later than those of the Sandwich Tern. Of the habits of this bird, Dixon, who was at the Farnes in the breeding-season of 1880, writes:—"As a rule, I found the breeding-grounds of the Common Tern further from the water than those of the Arctic Tern, amongst the grass and sea-campion on the higher parts of the island. As our boat approached the nursery of this Tern, the rattle of the oars in the rowlocks disturbed numbers of them that were basking on the beach or floating on the little pools. They soon took wing and flew lightly round us; and as we landed others rose from all parts of the island, and the air was speedily filled with screaming Terns. On the beach we passed numerous eggs of the Arctic Tern laid amongst the shingle, and their owners fluttered just above our heads with anxious cries. It was a pretty sight, and one not likely to be forgotten.

High in air the Terns of both species were coursing hither and thither, looking exactly like a heavy snowstorm. The main colony was on a bare patch of ground amongst the luxuriant herbage. All the eggs I obtained were laid in scanty nests—mere hollows, lined with a few bits of half-dried grass and broken stalks of the sea-campion. During the whole time of our stay the birds kept up an incessant chorus of cries, and did not finally settle until our boat was some distance from the island again."

The Common Tern often lays its eggs within a few feet of the water, and in many cases dispenses with a nest altogether. It generally establishes its colony on a bare shingly portion of the beach, or amongst the scant herbage on an ocean rock.

The eggs of the Common Tern are two or three in number, never more. They vary in ground-colour from pale greyish buff to brownish buff, occasionally with a tinge of green. The overlying spots are dark brown, sometimes almost black, and the underlying spots are grey. The spots are generally small, less than the size of a pea, and generally distributed somewhat sparingly over the whole surface, but sometimes in a band near the large end of the egg. Occasionally a few of the spots are confluent and form a large blotch, and in very rare instances streaks are to be found. They vary in length from 1·8 to 1·5 inch, and in breadth from 1·3 to 1·15 inch. They cannot with certainty be distinguished from eggs of the Arctic Tern or Roseate Tern.

The young are assiduously tended by their parents, being fed on very small fish and crustaceans. Those breeding in inland districts often fly long distances to salt water to obtain food for their young, passing to and fro, carrying the small fish crosswise in their bills. Legge says that in Ceylon, where this species winters, it frequents those parts of the coast where enormous shoals of sardines abound, and that when tired of fishing it often rests on the beach. In autumn the Common Tern collects into large flocks, one colony of birds apparently joining another, and the journey south is performed leisurely, the flocks staying in suitable places where food abounds.

The Common Tern is rather larger than the Arctic Tern, and not so large as the Gull-billed Tern, but the fork of the tail is much deeper than in the latter species (varying from $2\frac{3}{4}$ to $1\frac{1}{4}$ inch). In the general colour of its plumage, and the changes which it undergoes, it very closely resembles the Arctic Tern, but the underparts are generally suffused with pale French grey. Bill orange-red, with a black tip; legs and feet orange-red; irides hazel. In immature birds, and in adults in winter, the colour of the bill, legs, and feet is paler.

Young in down have the upper parts brownish buff mottled with black, and the underparts pure white, expect on the throat, which is dark brown.

STERNA ARCTICA.

ARCTIC TERN.

(Plate 46.)

Sterna paradisæa, *Brünn. Orn. Bor.* p. 46 (1764); *Baird, Brewer, & Ridgway, Water-Birds N. Amer.* ii. p. 299 (1884).

Sterna hirundo, *Linn. Syst. Nat.* i. p. 227 (1766, partim); *Sharpe & Dresser, B. Eur.* viii. p. 255 (1872)*.

Sterna macrura, *Naum. Isis*, 1819, p. 1847.

Sterna arctica, *Temm. Man. d'Orn.* ii. p. 742 (1820); **et auctorum plurimorum**—*Swainson & Richardson, Brehm, Boie, Sundevall, Bonaparte, Stephens, Selby, Sabine, Jenyns, Blakiston, Macgillivray, Yarrell, Audubon, Nuttall, Godman, Tristram, Hartlaub*, &c.

Sterna nitzschii, *Kaup, Isis*, 1824, p. 153.

Sterna brachytarsa, *Graba, Reise nach Farö*, p. 218 (1830).

Sterna marina, *Eyton, Cat. Brit. B.* p. 55 (1836).

Sterna brachypus, *Swains. B. W. Afr.* ii. p. 252 (1837).

Sterna pikei, *Lawr. Ann. Lyc. New York*, vi. p. 3 (1853).

Sterna senegalensis, *Swains., fide Schleg. Mus. Pays-Bas, Sternæ*, p. 16 (1863).

Sterna portlandica, *Ridgw. Am. Nat.* viii. p. 433 (1874).

It is not a little remarkable that the Arctic Tern should have been confounded with the Common Tern until so late as 1819. It is scarcely less remarkable that it should have been reserved for an inland ornithologist to point out the differences between the two species; but when we learn that this ornithologist was no less a person than the great Naumann, we cease to wonder. It is to be regretted that he attempted to change the name of the Common Tern, whilst giving a name to the new species which

* Most ornithologists regard the attempt to transfer the name *Sterna hirundo* from the Common to the Arctic Tern by Sharpe and Dresser, following in the wake of Bonaparte, Gray, and others, and that of *Saxicola stapazina* from the Black-throated to the Black-eared Chat by Dresser, after Sharpe had ceased to help him with the 'Birds of Europe,' as acts of ignorance and folly on the part of two juvenile ornithologists who had nothing new to say on the birds of which they wrote, and consequently made a desperate effort to achieve notoriety by introducing novelties into nomenclature. There is, however, another view of the question which is worth consideration before their conduct can be condemned. The *reductio ad absurdum* which their proceeding caused most unprejudiced ornithologists to make, as to the possibility of carrying out the rules of the Stricklandian Code, has been of infinite service to ornithology; and when we consider that the apparent folly of Sharpe and Dresser has been the cause to a great extent of the present emancipation of ornithologists from the trammels of the Rules of the British Association, which are now practically a dead letter, I think we all owe a debt of gratitude to these two gentlemen who thus heroically sacrificed their reputation for common sense and sound judgment for the good of the science they loved.

Although Linnæus was a great naturalist, his knowledge of birds was very small; and there can be little doubt that he did not discriminate between the Arctic and the Common Terns, and that his *Sterna hirundo* applies to both.

he had discovered. The consequence of this unwise step was that in the following year Temminck renamed the species, on the ground that both the specific names given by Naumann were inappropriate; and Temminck's name has been adopted by an overwhelming majority of ornithologists. Selby was probably the first writer to point out that the Arctic Tern was a common British bird.

It is the Tern *par excellence* of the British coasts, especially north of the Tweed. It breeds in the Shetlands (where it replaces the Common Tern), in the Orkneys, throughout the Hebrides, and in all suitable places on the entire coast-line of Scotland, but always prefers an island to the mainland. On the east coast of England its great stronghold is on the Farne Islands; whilst on the west it breeds on the shores of Cumberland, on Walney Island, and in a few localities on the Welsh coast. On the south coast it certainly breeds on the Scilly Islands, but is rarer than the Common Tern, whilst on the Channel Islands it is only known as passing on migration. In Ireland it breeds in many localities, principally on the west coast.

The geographical distribution and the migrations of the Arctic Tern are perhaps more curious and interesting than those of any other British bird; but no ornithologist appears to have understood their peculiarities or attempted to explain them. The Arctic Tern appears to have been originally an oceanic species, visiting in summer the North Atlantic, and breeding in Spitzbergen, the coast of Norway, the basin of the Baltic, the Faroes, Iceland, Greenland, the shores of Baffin's and Hudson Bays, and the east coasts of Canada and the United States as far south as Massachusetts. In winter its range was confined, as it now is, to the Atlantic. It visits the Azores, the Canaries, and the west coast of Africa down to the Cape. It enters the Mediterranean as far east as the Adriatic, and has been known to round the Cape and wander as far as Madagascar. On the American side it ranges as far south as the coasts of Brazil, occasionally crossing the isthmus of Panama to the coasts of Northern Peru. This winter range appears to have always been extensive enough; but as their numbers increased, the Arctic Terns appear to have extended their breeding-range east and west. The eastern line of migration apparently extends across country from the Gulf of Finland to the lower valleys of the Petchora, the Obb, the Yenesay, and the Lena, down which some of the birds migrate to the Arctic Ocean, following the break-up of the ice on these great rivers. The western line of migration extends along the shores and lakes of Arctic America, the two streams of migrants meeting at Behring's Straits, where the Arctic Tern breeds in great numbers, although it apparently is unknown in the North Pacific. This geographical distribution, if I have understood it rightly, is a most interesting case of the breeding-range having been extended until it has become circumpolar; but,

in consequence of the old routes of migration having been strictly observed, the winter-quarters remain unchanged. In point of fact, the Arctic Tern has not yet discovered the existence of the Pacific Ocean, and evidently regards Behring's Sea and the Bay of Panama as a couple of lakes!

In the South Atlantic Ocean the Arctic Tern is represented by three perfectly distinct species—*Sterna virgata*, *S. vittata*, and *S. hirundinacea*,—which range from Tristan d'Acunha to Kerguelen Land and the southern coasts of South America.

The Arctic Tern reaches our coasts in spring, about the same time as the Common Tern, during the last half of April, arriving at the Danish islands early in May. It reaches Iceland during the first half of May: Harvie-Brown and I did not observe it in the valley of the Petchora until the 14th of June, but in the valley of the Yenesay it arrived on the 6th of June. On the last British Arctic expedition three Arctic Terns appeared in the vicinity of the 'Alert's' winter-quarters in Grinnell Land on the 16th of June. The migration south commences in August and lasts through September and October.

In its habits the Arctic Tern differs very little from its relative the Common Tern. During its sojourn on our coasts it frequents rocky islands and sandy islets, and portions of the mainland coast that are both secluded and furnish a suitable nesting-place. Like all the Terns the Arctic Tern is gregarious and lives in colonies, sometimes of enormous size, at others consisting only of a few pairs. On the wing it is even more graceful than the Common Tern. It looks the perfection of elegance as it beats along the coast, its long wings moved now slowly, now quickly, in a very Gull-like manner. Flocks of these birds usually hunt for food in company, flying along in a loose straggling manner. Every now and then one of them drops suddenly down into the water as if shot, and rises again with a little struggling fish in its bill. Sometimes it will convey its capture to the nearest land, or not unfrequently sit on the water until it has eaten it. It is surprising with what force this bird descends; and the splash it makes can be distinctly heard for half a mile across the water. Like the Common Tern it rarely perches on the ground, save at its breeding-place or when about to rest or sleep, and it seldom tries to walk far. The air is its true element, and its long narrow wings seem never tired of bearing its little body to and fro. It sometimes floats buoyantly on the water for a short time, but never dives.

The food of the Arctic Tern is composed of fry, small fish, crustaceans, sand-eels, &c. It is very fond of sitting on old stumps, from which it swoops down to catch a passing fish, in a very similar manner to the Kingfisher. Like that of most Terns the call-note of the Arctic Tern is a prolonged *krr-ee*; but its alarm-note is more distinctive, and may be represented by the syllable *keer*.

The favourite breeding-grounds of the Arctic Tern are on uninhabited islands; and failing these it prefers a part of the mainland coast which is little frequented, where it can rear its young in peace. In many places the Common Tern breeds on the same islands, but in almost all cases each species has its own colony. The breeding-season commences at the Farne Islands in the first half of June, during which period fresh eggs may be obtained. Its eggs are generally laid quite close to the sea on the coarse pebbles, sand, and shingle, sometimes amongst drifted seaweed. A nest is very seldom constructed, and if such a provision is made it is of the slightest description—a little hollow lined with a few scraps of dry grass or stalks of marine herbage. The nests are often destroyed by high tides, and the birds not unfrequently change their station year by year. The eggs of the Arctic Tern are two or three in number, never four, and very closely resemble those of the Common Tern, but are on an average slightly smaller, generally much more boldly blotched, and the ground-colour is much more often tinged with olive, and very frequently is a buffish brown, much darker than the brownish buff of the Common Tern. They vary in length from 1·6 to 1·45 inch, and in breadth from 1·2 to 1·1 inch.

When its breeding-grounds are invaded the Arctic Tern becomes very anxious, all the members of the colony rising into the air and fluttering above in anxious tumult, being joined by the Common Terns, both species mixing indiscriminately. Should a Crow, a Skua, or a Gull make its appearance near the colony of Terns, the Arctic Tern is the first to attack the rash intruder, who is generally made to beat a hasty retreat. So close are the nests to each other in some colonies that it is almost impossible to walk without breaking the eggs. It is very probable that the Arctic Tern only rears one brood in the year; but, as every visitor to the Farne Islands knows, should the first eggs be taken, as they generally are, the bird lays again. Late broods are sometimes met with. Capt. Feilden found a small colony of Arctic Terns on the 21st of August on a small island in lat. 81° 44′ N. At this date the ground was covered with nearly three inches of snow; and in one nest, which contained a newly hatched bird, the parents had apparently thrown out the snow as it accumulated, and thus formed a barrier round their helpless offspring. As is the case with so many shore-birds, the Arctic Tern does not sit much on its eggs in the daytime; if the weather is fine the sun performs a great part of their incubation.

The Arctic Tern is the commonest British species of the group to which it belongs, and which vary very slightly in the general colour of their plumage or in the successive changes which they undergo. There is little difference in the colour of the sexes. The species contained in this group mostly agree in having a black cap in the breeding-plumage. The black extends from the nostrils to the nape, but does not reach below the eye

on the sides of the head, nor to the gape on the lores. The general colour of the rest of the upper parts is French grey, darker on the quills, and paler on the rump and upper tail-coverts; the outer web of the outer tail-feather on each side and the outer web of the primary are generally a darker grey; the inner webs of the primaries are broadly margined with white, frequently almost reaching to the shaft, but seldom to the tip of the feather, and always forming a well-defined pattern. The wings and tail are generally very long, and the latter more or less deeply forked. The whole of the underparts, including the under wing-coverts, are generally pure white. The colours of the bill, legs, and feet vary in each species. After the autumn moult, which generally takes place during August, the black disappears from the forehead, and that on the crown and nape is streaked with white. After the first spring moult, which generally takes place during February, the amount of black on the head is intermediate between that of adult summer and adult winter plumage, and the lesser wing-coverts are more or less streaked with brown. Birds of the year (a plumage which follows so closely upon that of young in first plumage that the moult to the former may be said to begin as soon as the latter is completed) have pale margins, emphasized by brown sub-margins to the scapulars, innermost secondaries, and the tips of the tail-feathers. In young in first plumage these pale margins are buff, and the sub-margins dark brown, and they extend to the feathers of the mantle and to the ear-coverts, and traces of them are to be found on the upper tail-coverts and on the feathers of the rump and breast.

The Arctic Tern is slightly less than the Common Tern, though it measures the same in length of wing, and the fork of the tail is about the same. In the general colour of its plumage and the variations which it undergoes it is typical, except that the rump and upper tail-coverts are pure white and the underparts are suffused with French grey. In adults the bill, legs, and feet are deep crimson; but in young birds these parts are duller in colour; irides hazel. The adult Arctic Tern may be distinguished from the Common Tern by the slightly darker French grey of the underparts, and at all ages and seasons by its shorter tarsus (which scarcely exceeds half an inch in length, instead of nearly approaching three quarters of an inch) and by the greater amount of white on the inner web of the first two or three primaries. In the Arctic Tern the grey stripe along the shaft on the inner web is no broader than the outer web, whereas in the Common Tern it is nearly twice as broad.

Young in down have the upper parts greyish brown mottled with black, and the underparts pure white clouded with brown on the flanks and vent; but the throat, sides of the head, and forehead are dull black.

STERNA MINUTA.

LESSER TERN.

(Plate 46.)

Sterna minor, *Briss. Orn.* vi. p. 206, pl. 19. fig. 2 (1760).
Sterna minuta, *Linn. Syst. Nat.* i. p. 228 (1766); **et auctorum plurimorum**—*Temminck, Naumann, Degland & Gerbe, Dresser, Saunders,* &c.
Sterna metopoleucos, *S. G. Gmel. Nov. Comm. Petrop.* xv. p. 475 (1771).
Sternula minuta (*Linn.*), *Boie, Isis,* 1822, p. 563.
Sterna antarctica, *Licht. Forster's Descr. Anim. It. Mar. Austr.* p. 107 (1844).

The Lesser Tern is nowhere very abundant in the British Islands. It breeds sparingly on the Orkneys, and is generally distributed in scattered colonies round the Scotch coasts and in one or two inland districts, as, for instance, on Loch Lomond. In England several haunts of the Lesser Tern have been deserted; but a few pairs breed on Spurn Point, a few on the Lincolnshire coast, and thence it is found in scattered colonies on the Norfolk, Suffolk, and Essex coasts, and round the southern shores of England, but not extending to the Channel Islands. A few colonies exist on the Welsh coast, as also on the coasts of Lancashire and Cumberland. It is locally and somewhat sparingly distributed on the Irish coasts, and also in a few localities on the freshwater loughs.

The range of the Lesser Tern is very restricted, and must be regarded as inland rather than oceanic. It is a summer visitor to Europe as far north as lat. 58°, ranging eastwards through Persia to Turkestan. It winters in West Africa and in the valley of the Nile, where a few remain to breed in Egypt. It has occurred in South Africa, but appears rarely to migrate so far south.

The Lesser Tern has several rather close allies. In North America it is represented by *Sterna antillarum*, in South America by *S. superciliaris* and *S. exilis*, in South Africa by *S. balænarum*, in South Australia and New Zealand by *S. nereis*, in the Red and Arabian Seas by *S. saundersi*, and in South-eastern Asia and North Australia by *S. sinensis*. From all these species the Lesser Tern can be distinguished by well-marked characters, and may be diagnosed as having not only a white rump, but also dark shafts to the three outer primaries.

The Lesser Tern is a somewhat late bird of passage. Irby says that at Gibraltar the earliest date on which he observed it was the 10th of May; it arrives on the British coasts about the middle of May, which is also the time of its arrival in Denmark. In Greece it appears much earlier,

and Dr. Krüper says that it breeds late in April. Late to arrive, this charming little Tern is one of the earliest to leave our shores, departing for the south again in September. It is said to leave Denmark early in August, which is also about the date of its departure from Transylvania. The latest date on which Irby observed this bird at Gibraltar was on the 25th of October.

The Lesser Tern is a very interesting little bird. It frequents sandy rather than rocky coasts, and it generally shares its breeding-grounds with some species of Ringed Plover. In its habits it differs very little from the Arctic and Common Terns. Its life is for the most part spent on the wing, beating slowly along, a few yards above the rippling surface of the water, every now and then swooping down, or falling as if shot, to catch its finny prey. It is rather a noisy bird. In addition to the call-note *krr-ee*, which is common to most of the Terns, it has an alarm-note, constantly heard when its colonies are invaded, and which may be rendered as *ikr* or *wikr*.

There are few places where this bird breeds in greater abundance than on some of the islands in the lagoon of Missolonghi. During the week I spent there at the end of May 1873, I blew two hundred and fifty of its eggs, and might have taken hundreds more if I had wanted them. The lagoon is very shallow, and flat-bottomed boats alone can be used. On some of the islands where the Pelicans breed there is little or no vegetation; others are covered with short grass and are surrounded by reeds, here the Redshank and the Black-headed Wagtail make their nests. Many of the islands are black, dried-up, and cracked mud, with patches of marine plants of various thick-leaved species, where the Pratincoles breed, whilst others have extensive beaches of bare sand. On these sandy flats the Kentish Plover, the Gull-billed Tern, and the Common Tern breed in some numbers, but by far the most abundant bird is the Lesser Tern. It makes no nest, but generally scratches a slight hollow in the sand, or in the long line of broken reeds, bits of cork, dead grass, seaweed, or similar rubbish, which marks the limit of the wavelets produced on the lagoon by the storms of winter. Three is the usual number of eggs, but now and then four are found in one nest, possibly the produce of two females.

In their ground-colours the eggs of the Lesser Tern vary precisely to the same extent as those of the Common Tern, from pale greyish buff to dark buff, occasionally with a slight shade of olive; but in the boldness of their spotting they very frequently equal the eggs of the Arctic Tern; otherwise they may be regarded as miniature eggs of these two allied species. They vary in length from 1·3 to 1·2 inch, and in breadth from 1·0 to ·9 inch. Some of them very closely resemble eggs of the Kentish Plover; but the latter may generally be recognized by their more pyriform shape, and by most of the markings being streaks rather than spots.

The Lesser Tern is very similar to the Arctic Tern, but is only about half the size, and is further distinguished by the peculiarity of having the forehead white at all seasons; the black reaches to the nostrils, but the white on the forehead extends over the eye. Bill yellow, tipped with black; legs and feet bright orange; irides hazel. Males do not differ in colour from females, nor is there any perceptible difference in the plumage of winter from that of summer. Otherwise the Lesser Tern resembles the Arctic Tern in the general distribution of its colours and the successive changes of plumage which it undergoes.

Young in down have the upper parts buff mottled with black on the head and with grey on the back; the underparts are dull white.

STERNA FULIGINOSA.

SOOTY TERN.

(Plate 48.)

Sterna fuliginosa, *Gmel. Syst. Nat.* iii. p. 605 (1788); **et auctorum plurimorum** —*Wilson, Audubon, Baird, Brewer & Ridgway, Saunders*, &c.
Sterna infuscata, *Licht. Verz. Doubl.* p. 81 (1823).
Onychoprion serrata, } *Forster, fide Wagl. Isis*, 1832, pp. 277, 1222.
Planetis guttatus, }
Haliplana fuliginosa (*Gmel.*), *Wagl. Isis*, 1832, p. 1224.
Hydrochelidon fuliginosum (*Gmel.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 61 (1838).
Sterna serrata, *Forster, fide Licht. ed. Forst. Descr. An. It. Mar. Austr.* p. 211 (1844).
Thalassipora infuscata (*Licht.*), *Rüpp. Syst. Uebers.* p. 140 (1845).
Anous l'herminieri, *Less. Desc. Mamm. et Ois.* p. 255 (1847).
Onychoprion fuliginosus (*Gmel.*), *Gould, B. Austr.* vii. pl. 32 (1848).
Sterna gouldi, *Reich. Schwimmvög. Suppl.* pl. xxii. fig. 829 (1848).
Haliplana infuscata (*Licht.*), *Licht. Nomencl. Av.* p. 97 (1854).
Haliplana serrata, *Bonap. Compt. Rend.* xlii. p. 773 (1856).
Sterna luctuosa, *Phil. & Landb. Wiegm. Arch.* 1866, p. 126.
Haliplana fuliginosa, *var.* crissalis, *Baird, fide Lawr. Proc. Bost. Soc. N. H.* 1871, p. 285.
Hydrochelidon infuscata (*Licht.*), *Heugl. Orn. Nordost Afr.* ii. p. 1457 (1873).

The earliest description which can be found of the Sooty Tern is contained in a very graphic account of the breeding of this species on Ascension Island, which was communicated by Viscount de Querhoënt to Buffon, who gave to the Sooty Tern the name of "L'Hirondelle de Mer à Grande envergure," on account of its great extent of wing. In 1784 Pennant described this bird more carefully ('Arctic Zoology,' ii. p. 523) under its now familiar name of Sooty Tern, from an example which was sent from New York to Sir Ashton Lever. He added to his own description a translation of part of Buffon's of the enormous numbers which breed on the Island of Ascension. In the following year Latham added considerably to our knowledge of the geographical distribution of this bird; but the Sooty Tern was not dignified with a Latin name until 1788, when Gmelin compiled his edition of Linnæus's 'Systema Naturæ.'

The Sooty Tern is a bird of the tropics, but on two occasions it appears to have strayed as far as our islands. The first example was shot in October 1852, near Burton-on-Trent (Brown, 'Zoologist,' 1853, p. 3755), and was figured in Yarrell's 'British Birds;' and the second was shot on

the 26th of June, 1869, on the Thames, near Wallingford, in Berkshire (Harting, 'Handb. Brit. Birds,' p. 170).

The Sooty Tern is an oceanic species, resident throughout the tropics, only accidentally wandering into the temperate regions. In addition to the two British examples already mentioned, the Sooty Tern has occurred three times in Europe—once near Magdeburg in Central Germany, once near Verdun in North-east France, and once near Fenestrelle in North-west Italy. In the Atlantic its principal breeding-places are the islands off the coast of Florida and the West Indies, the Island of Ascension, and St. Helena, whilst it occurs at all seasons of the year within the tropics on the Atlantic coast of both America and Africa, and accidental stragglers have been found as far north as the Bermudas. The principal breeding-places in the Indian Ocean are the islands in the Red Sea, the Mekran coast, and the Laccadive Islands; whilst it occurs on the coast of the mainland and all the islands within the tropics, ranging eastwards throughout the Malay archipelago and the coasts of Australia into Polynesia, and the Pacific coasts of America from California to Chili. It is said, though on very unsatisfactory evidence, to have strayed as far as Japan and the Aleutian Islands.

The Sooty Tern is almost exclusively a sea-bird, living upon fish or any other food to be found on the waves. It is a bird of rapid and powerful flight, and is seldom seen to alight on the water. Audubon says that it swoops down upon its prey, never dropping upon it as the European Terns do. He likens its note to the syllables *oo-ee*. He says that it never makes a nest, but merely scratches a hollow in the sand in which to deposit its eggs.

Ascension Island, the great breeding-place of the Sooty Tern, is situated a little south of the line, about a thousand miles from Africa, and rather more from South America. It is little better than a huge cinder-heap, with scanty vegetation struggling between the stones, and a green cap on the top of the highest point, which rises 2800 feet above the level of the sea. The extent of the island is perhaps thirty square miles, and several species of birds resort to it to breed—Gannets, Tropic and Frigate-birds, and three or four kinds of Terns. Of the latter the Sooty Tern is the most abundant: there are three colonies; one of them, much larger than either of the others, is situated in a sheltered valley. The breeding-season varies in different years, but may roughly be said to be during our winter. It is artificially prolonged by the number of eggs taken, from two to three thousand a day! The consequence is that the birds are obliged to lay many eggs, probably at intervals of a week or more, before they have the good luck to find a corner where they are allowed to sit. The eggs and young are said to lie so thick on the ground that it is almost impossible to walk without treading on them. It is said that they

only sit on a single egg; but this is, no doubt, the result of the constant robbery of the eggs, which is continued until the power of producing them is almost exhausted. Hume, who found this bird breeding on the Laccadive Islands, says that three is the full clutch. We can fortunately form some idea of the wonders of "Wide-awake Fair," as the great breeding-ground on Ascension Island is called, since it has been photographed in the height of the season, and various accounts have been published of the extraordinary scene—Collingwood, 'Zoologist,' 1867, p. 979; Sperling, 'Ibis,' 1868, p. 286; and Penrose, 'Ibis,' 1879, p. 272. The fact that the Sooty Tern, if not molested, will lay three eggs is also confirmed by Audubon, who found it breeding on the Tortugas Islands.

The eggs of the Sooty Tern vary in ground-colour from white to pale buff; the surface-spots are reddish brown, and the underlying spots are pale brown. The markings are generally evenly distributed over the surface of the egg, occasionally somewhat sparsely so, and not unfrequently displaying a tendency to form a zone round the larger end. The spots are generally small, ranging from the size of buckshot downwards. The eggs vary in length from 2·1 to 1·8 inch, and in breadth from 1·5 to 1·35 inch. They approach nearest to certain varieties of the Sandwich Tern; but although the spots on some examples of the eggs of the Sandwich Tern may be no larger in size, they are always darker in colour.

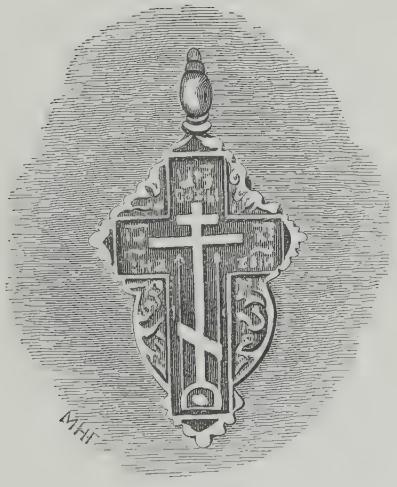
The Sooty Tern is almost as large as the Sandwich Tern, but has a shorter wing and a much longer and more deeply forked tail. It belongs to a different group to any of the Terns hitherto described, although it agrees with the Lesser Tern in the distribution of the black and white on the head, and probably also in the fact that the winter plumage does not differ from that of summer. The whole of the under surface of the body, including the under wing-coverts and the outer tail-feather on each side, is white, slightly suffused with slate-grey on the belly, under tail-coverts, the tips of the outer tail-feathers, and the under wing-coverts. The white on the breast extends to the sides of the neck, and almost, but not quite, meets on the nape at the termination of the black cap; the rest of the upper parts are sooty black. Bill, legs, and feet black; irides hazel. Young in first plumage are sooty brown, slightly paler on the underparts, the feathers of the mantle, the scapulars, innermost secondaries, upper tail-coverts, and tail having white tips. The intermediate stages of plumage are imperfectly known.

Young in down have the upper parts brownish grey and the underparts white.

Two other tropical species of Tern, the Smaller Sooty Tern (*Sterna anæstheta*) and the Noddy Tern (*Sterna stolida*), have been admitted into the British list upon what appears to be insufficient authority. Of the first of these species an example is recorded (Saunders, 'Zoologist,' 1877,

p. 213) as having been obtained on one of the lightships at the mouth of the Thames in September 1875. This specimen was purchased from a local birdstuffer by Mr. Bidwell, in whose collection it now is, two years after its alleged occurrence. Of the other species two examples are recorded (Thompson, B. Ireland, iii. p. 308) as having been shot about four years previously off the coast of Wexford; they were procured, roughly skinned, from the captain of a vessel, who stated that they had been shot in his presence. The geographical distribution of both these species differs very slightly from that of the Sooty Tern. The eggs of the Noddy Tern are figured on Plate 49; those of the Smaller Sooty Tern resemble the eggs of its larger ally, but are a little less.

Both these species of Terns are included in the 'List of British Birds compiled by a Committee of the British Ornithologists' Union,' whilst Bonaparte's Gull is rejected. The reasons for these decisions are inscrutable.



Genus LARUS.

The genus *Larus* was recognized by Linnæus in 1766, in the twelfth edition of his 'Systema Naturæ,' i. p. 224. The Common Gull (*Larus canus*) is generally regarded as the type; but no reason can be assigned for such a course, except that it has been so regarded by the majority of authors.

The Gulls may generally be distinguished from the Skuas and the Terns by their even tails; but Ross's Gull has the cuneate tail of a Skua, and Sabine's Gull has the forked tail of a Tern. The bill of the Gulls is also intermediate between that of the Skuas, which is more hooked, and that of the Terns, which is less so: in the Skuas the line of the gape rapidly curves downwards beyond the nostrils; in the Gulls the curve is more gradual; and in the Terns the degree of curvature scarcely alters from the base to the tip. As in the Terns, the slit of the nostrils in the Gulls is nearly longitudinal, whilst it is diagonal in the Skuas.

This genus may be regarded as cosmopolitan; it contains about fifty species, six of which have been removed into four little genera—in my opinion most unnecessarily, even by a "lumper," like Saunders; whilst in the hands of a "splitter," like Bonaparte, the Gulls are divided into no fewer than eighteen genera.

The Gulls frequent inland sheets of water, but are more often seen on or near the sea. Except during the breeding-season they are great wanderers, roaming hither and thither in search of their finny prey. Their food principally consists of fish; but this fare is varied with worms, insects, crustaceans, and even carrion, small mammals, and birds. Their flight is extremely buoyant, graceful, and well sustained. Upon the ground they walk somewhat clumsily, but they swim with ease. Their notes are harsh. They are generally gregarious throughout the year. They make more or less bulky nests, generally on the ground, but occasionally on cliffs, and even, in some cases, in trees; and their eggs closely resemble those of the Plovers and Sandpipers.

The subjoined key will enable the student to discriminate between any species of British Gull, with the following possible exceptions:—

Large examples of immature Herring-Gulls are difficult to distinguish from small examples of immature Great Black-backed Gulls and from large examples of immature Lesser Black-backed Gulls, but may generally be recognized by their paler coloration, especially that of the basal half of the tail, which is nearly white.

The variations in size of the Glaucous and Iceland Gulls are so great that in a large series it is sometimes very difficult to draw the exact line where one begins and the other ends; but exceptionally large examples of the Iceland Gull and exceptionally small examples of the Glaucous Gull are so rarely met with that the difficulty of discriminating between the two species is more imaginary than real; possibly they may be only subspecifically distinct.

a. Tail forked ..... L. SABINII.
b. Tail strongly cuneiform ..... L. ROSSI.
c. Tail even.
  a^1. Length of wing under $9\frac{1}{2}$ inches ..... L. MINUTUS.
  b^1. Length of wing from 10 to 15 inches.
    a^2. Primaries brown, with white terminal or subterminal spot. L. CANUS.
    b^2. Primaries French grey, broadly tipped with black; no hind toe ..... L. TRIDACTYLUS.
    c^2. Primaries white, with or without a brown terminal spot. L. EBURNEUS.
    d^2. Primaries white, with black tips, always margined on the inner web with black, and generally on outer web.... L. RIDIBUNDUS.
    e^2. Primaries white, with black tips and outer webs ..... L. PHILADELPHIA.
  c^1. Wing over 15 inches long.
    f^2. Primaries nearly uniform white or pale brown.
      a^3. Wing less than 17 inches long ..... L. LEUCOPTERUS.
      b^3. Wing more than $16\frac{1}{2}$ inches long..... L. GLAUCUS.
    g^2. Primaries nearly uniform dark brown; wing less than 16 inches. Mantle of adult dark slate-grey ..... L. FUSCUS*.
    h^2. A pale wedge (sharply defined at the tip) on the inner web of the second, third, and fourth primaries; length of wing from $15\frac{3}{4}$ to $17\frac{1}{2}$ inches. Mantle of adult pale French grey ..... L. ARGENTATUS.
    i^2. A distinct wedge on the third and fourth primaries; length of wing from $17\frac{1}{2}$ to $19\frac{1}{2}$ inches. Mantle of adult dark slate-grey ..... L. MARINUS.

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* It is probable that when this group of Gulls is investigated a complete series will be found connecting *L. fuscus*, through *L. affinis*, and *L. cachinnans* with *L. argentatus*. Special attention should be directed to the possible occurrence of *L. affinis* in our islands, as it has more than once been obtained in Heligoland. It is said to differ from *L. fuscus* in having a paler mantle, and in having the pattern on the primaries more clearly defined, and in very old birds appearing on the first primary, as in *L. argentatus*.

LARUS SABINII.

SABINE'S GULL.

(Plate 54.)

Larus sabini, *J. Sabine, Trans. Linn. Soc.* xii. p. 522, pl. 29 (1818); **et auctorum plurimorum**—*Schlegel*, (*Newton*), (*Dresser*), (*Saunders*), &c.
Xema sabini (*Sabine*), *J. Ross, App. Ross's Voy. Baff. Bay*, p. 57 (1819).
Gavia sabini (*Sabine*), *Macgill. Man. Brit. B.* ii. p. 241 (1842).

Sabine's Gull was discovered by Capt. Sabine at the head of Baffin's Bay in 1818, during Ross's first voyage to the Arctic regions. Four years later an example was shot in Belfast Bay on the 18th of September (Thompson, B. Ireland, iii. p. 309). Since this date between thirty and forty examples have been obtained in various parts of Great Britain and Ireland; with very few exceptions they were shot in September and October, and all of them except two were immature birds. After such repeated visits this bird may fairly claim to be regarded as a rare straggler to our islands on autumn migration.

Sabine's Gull is a circumpolar bird, breeding on the shores of the Arctic Ocean. It is not uncommon in various localities in Arctic America, from Alaska to Greenland. In the Old World it has been found on the Siberian side of Behring's Straits; Middendorff found it breeding in considerable numbers on the Taimur peninsula, and it has occurred in Spitzbergen. In winter it has occurred at Heligoland and in various localities on the coasts of France, on the Bermudas, the Atlantic coasts of America as far south as New York, and on several of the Great Lakes. It has also occurred on the Peruvian coast. The only other Fork-tailed Gull is *Larus furcatus*, a much larger bird, supposed to be found on the west coast of tropical America.

Like all the Black-headed Gulls, Sabine's Gull is an inland bird, at least during the breeding-season, though it appears never to breed far from the sea. It does not differ much from the other Black-headed Gulls in its habits; but Middendorff describes its flight as resembling that of a Tern. He states that it arrived at its breeding-grounds, in lat. 74°, on the Taimur peninsula on the 17th of June, and that he found it breeding in the last week of July, in company with the Arctic Tern, on the islands in the lakes and rivers of that district. The nests were mere depressions in the moss, lined with a few dead grass-stalks. The eggs were very highly incubated; but in the last week of August the young were not able to fly, though they dived with much agility, the parent birds flying round in great alarm, uttering incessant cries. Sabine also found this bird breeding in company

with the Arctic Tern, and describes the eggs as two in number, but states that they were placed on the bare ground; he also describes the great anxiety of the parent birds at the nest. MacFarlane obtained eggs of this bird from an island in a lake on a promontory stretching out into the Arctic Ocean, east of the Mackenzie river, in June, and states that the eggs were occasionally three in number. Richardson found it breeding on an island in the Arctic Ocean a few miles to the west of MacFarlane's locality, and states that the eggs were deposited in hollows in the short and mossy turf.

The eggs of Sabine's Gull vary in ground-colour from pale brown to dark brown, occasionally approaching olive-brown. The spots are small, varying from the size of a pea downwards, and are generally somewhat indistinct and sparingly but evenly distributed. The surface-spots are darkish brown, and the underlying spots are greyish brown but very indistinct. Occasionally one or two almost black spots or streaks are found, principally at the large end of the egg. They vary in length from 1·8 to 1·7 inch, and in breadth from 1·3 to 1·2 inch. In colour the eggs of this bird most nearly resemble Skua's eggs, but are much too small to be confused with any of them.

Adams, who met with Sabine's Gull in Alaska, states that it feeds upon worms and insects; Middendorff found the stomachs both of the old and young filled with the larvæ of a dipterous insect; but Sabine asserts that it obtains its food on the beach near the water's edge, picking up the marine insects that are cast on the shore.

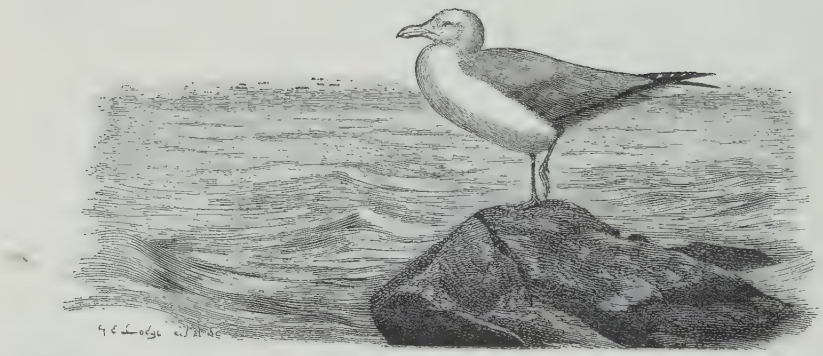
The Black-headed Gulls form a small group, which resemble the Terns in having a black head during the breeding-season; and Sabine's Gull presents another point of affinity with that genus in having a forked tail, the outside feathers being an inch longer than the central ones. It is one of the smallest species of the genus. The adult in breeding-plumage has a dark slate-grey head and nape, emphasized by a narrow black collar round the neck, which is pure white below it. The rest of the plumage is typical Gull-colour—*i. e.* mantle, scapulars, and most of the wing-coverts French grey; upper tail-coverts, tail, and underparts white; quills black, marked with white on the tips and on the outer half of the inner webs. Bill black, vermilion at the tip*; legs and feet bluish black; orbits carmine; irides hazel. After the autumn moult the dark hood disappears, but the back of the neck has become a dark slate-grey; it is possible, however, that the latter character may be the remains of immature plumage.

* Gould, Dresser, Saunders, and Baird, Brewer and Ridgway describe the bill of Sabine's Gull as black, with a yellow tip. This is probably the colour in the dried skin. Middendorff expressly states that Gould's figure is wrong, that in the living bird the colours are very brilliant, the tip of the upper mandible being vermilion and that of the lower mandible paler vermilion, approaching lemon-colour.

The intermediate stages of plumage are unknown; but birds of the year have a broad black band margined with brown at the end of the tail; and the scapulars, innermost secondaries, and most of the wing-coverts are similarly coloured.

Young in first plumage do not differ much from adults in winter plumage in the colour of their wings and underparts, but the narrow pale brown margins and broad dark sub-margins are conspicuous on nearly every feather of the upper parts.

Young in down are described by Middendorff as rusty yellow above and whitish grey below, the throat and upper breast and the whole of the upper parts being spotted with black.



LARUS MINUTUS.

LITTLE GULL.

(Plate 54.)

Larus minutus, *Pall. Reise Russ. Reichs*, iii. p. 702 (1776); **et auctorum plurimorum**—*Gmelin, Naumann, Temminck, Dresser, Saunders*, &c.
Larus atricilloides, *Falk, Russ. Reis.* iii. p. 355, pl. 24 (1785).
Xema minutus, *Boie, Isis*, 1822, p. 563.
Hydrocolœus minutus (*Pall.*), *Kaup, Natürl. Syst.* p. 113 (1829).
Larus nigrotis, *Less. Traité d'Orn.* p. 619 (1831).
Chroicocephalus minutus (*Pall.*), *Eyton, Cat. Brit. B.* p. 54 (1836).
Gavia minuta (*Pall.*), *Macgill. Hist. Brit. B.* v. p. 613 (1852).

The Little Gull is one of several species of birds which were unknown to Linnæus and Brisson, but which were discovered by Pallas shortly after the publication of the great works of those distinguished naturalists. It is also one of several species which were first recorded as occurring in the British Islands by Colonel Montagu, who included it in the Appendix to the Supplement of his 'Ornithological Dictionary,' published in 1813. The example which Montagu identified with Pallas's species was an immature bird shot on the Thames near Chelsea. Since then the Little Gull has been found to be a somewhat irregular visitor to our shores on migration and in winter. It has occurred in various parts of England, Scotland, and Ireland, as far north as the Shetland Isles. It generally appears in small flocks, and has been most frequently observed on the east coast of England. In 1868 fourteen examples were procured on the Yorkshire coast (Gurney, 'Zoologist,' 1868, pp. 1379, 1424, 1462, 1482) from the 12th of July to the 21st of November; and in the following winter about thirty examples were shot on the Yorkshire coast, about sixty on the Norfolk coast, and others in various localities, the greater number having been procured in February 1870, a month which was remarkable for violent gales from the north-east (Stevenson, Trans. Norf. and Norw. Nat. Soc. 1871, p. 66).

The geographical distribution of the Little Gull is specially interesting, because this bird is one of the very few species whose summer range extends to North-east Siberia, but whose winter range is confined to South-west Asia, South Europe, and Africa. The breeding-range of the Little Gull extends from the lakes of Ladoga and Onega, through Southern Siberia, to the Stanavoi mountains and the southern shores of the Sea of Ochotsk. It passes through Turkestan on migration, and winters in the

Caspian, the basin of the Mediterranean, and the west coasts of France and Spain. It is said to breed as far north as Archangel, an assertion which is corroborated by the fact that Finsch procured young in first plumage north of Obdorsk. It has once occurred in North India. The Little Gull has no very near ally.

Although the Little Gull, like most of the other Black-headed Gulls, is an inland bird during the breeding-season, and is occasionally seen on sheets of fresh water during winter, especially at the mouths of rivers, it principally frequents the sea-coasts and the lagoons near the shore after its young are reared. This small Gull has a somewhat desultory flight. It is not nearly so wild and difficult to approach as most Gulls are, and at all seasons of the year is more or less gregarious, and even in winter may be seen in small parties flying along the coast or floating on the waves. Its note is described by Naumann as short and screeching and as different from that of any other Gull or Tern. Its food in summer consists chiefly of insects, many of which it catches on the wing, like a Swallow or a Goatsucker; but in winter it feeds principally on marine animals of various kinds, which it picks up on the shore or finds floating on the water; and both in summer and winter small fishes have been found in its stomach.

The Little Gull remains late in its winter-quarters, in consequence of the lateness of the summer in the northern latitudes in which it breeds. The accounts of its having bred in Holland, Turkey, and South Russia are doubtless erroneous, the fact of its remaining in its winter-quarters until May having caused the observers to take for granted that it must have been breeding at that time. It disappears from the Black Sea about the middle of May, and migrates at once to its breeding-quarters, leaving them again early in August, and reappearing in the south some time during September.

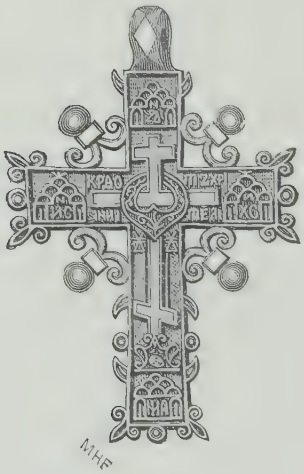
The best-known breeding-place of the Little Gull is near Lake Ladoga, where there are several colonies, which have been described by various writers. Blasius visited this interesting breeding-place in 1840, and it was afterwards described by Lilljeborg, who went there four years afterwards, and by Meves, who explored it in 1869. There are other breeding-colonies of the Little Gull in the same district; and I have a fine series of their eggs, collected by my friend the late M. Valerian Russow, at the mouth of the river Kassarien, in Esthonia, in 1873. In many of these colonies the Little Gull was found breeding in company with the Common Tern—a rather unfortunate circumstance for egg-collectors, as the eggs of the two species are absolutely indistinguishable. Meves supposed that he had discovered a mode of distinguishing the eggs of the two species by the colour of the yolk, that of the Gull being rich orange-red, whereas that of the Tern was ochre-yellow. In describing the eggs of the Little Gull, Meves

remarks that he never found them with the ground-colour greyish white, like the eggs of the Common Tern; but in the series obtained for me by M. Russow there are Little Gull's eggs with the ground-colour pale. Mr. J. E. Palmer informs me that in blowing several dozen eggs of the Herring-Gull, obtained on Lambay Island, off the coast of co. Dublin, all of which were perfectly fresh, he found that those eggs which had a dark ground-colour had deep-coloured yolks, whilst those with a pale ground-colour had pale yolks. It appears as if Meves had generalized from too few facts, and that the colour of the yolk cannot be relied upon as a distinguishing character.

The nests of the Little Gull are described as placed very near to each other, occasionally on the marshy banks of the lakes, but more usually on the floating islands, which are enormous masses of living water-plants, almost overwhelmed by many years' accumulations of decayed and decaying vegetable matter. These islands rise and fall with the water, and are admirably adapted for nesting-sites. Russow describes a colony built on the solid ground on the margin of a lake, which was swamped by a flood, in consequence of which the Little Gulls formed a new one a few hundred yards away from the water, and, as if to provide against a similar catastrophe, had collected foundations of dead grass, about six inches high. On the 7th of June he found the birds busily engaged in collecting materials for their second nests, which contained full clutches of eggs on the 16th of that month. The nests are built of sedge, dead reeds, and grass, the finer portions being reserved for the lining. The usual number of eggs is three, but two are occasionally found; and both Meves and Russow state that sometimes four eggs were laid in one nest. They vary in ground-colour from greyish buff to buffish brown and olive-brown. The surface-spots are dark brown, sometimes approaching black, and the underlying spots, which are generally very distinct (except on the eggs having a dark ground-colour), are grey. The size of the spots varies from that of a pea downwards; occasionally two or three of them are confluent and form an irregular blotch, and in some instances streaks are intermingled. They vary in length from 1·75 to 1·5 inch, and in breadth from 1·22 to 1·18 inch. Both parents assist in the duties of incubation. At their nests they fly round and round the head of an intruder, endeavouring to entice him away, sometimes retiring in a body to a distance, but, if not followed, soon returning again to renew their efforts.

The Little Gull, the smallest of all the Gulls, is about the size of a Common Tern, but its wings and tail are much shorter. In addition to the black head, the blackish under surface of the wings appears to show an affinity to the Black Tern; but as the latter character disappears in immature birds, it is probably not ancestral. The Little Gull, in full breeding-plumage, has the entire head deep black; the underparts, including the

entire neck, the upper tail-coverts, and the tail, are pure white, suffused with rose-colour on the breast. The under surface of the quills is brownish black, and the under wing-coverts are dark slate-grey; the rest of the upper parts are French grey; the quills have broad white tips. Bill dark blood-red; legs and feet vermilion; irides hazel. After the autumn moult the black hood disappears, except a few black streaks on the hind head, nape, and ear-coverts, and the bill and feet are paler. After the first spring moult, the only signs of immaturity are a few white feathers on the forehead, and some brown marks across the wing-coverts. Birds of the year resemble adults in winter plumage, but have a broad black terminal band to the tail, shading into white at the tip; the under wing-coverts are nearly white; the quills are dark slate-grey, with white tips, and have a white pattern on the inner webs; the wing-coverts and innermost secondaries are almost black, with pale edges, and the brown marks on the wing-coverts form a conspicuous dark band. Young in first plumage have the crown, ear-coverts, and nape brown, and, in addition to the signs of immaturity to be found in birds of the year, the feathers of the back and scapulars are nearly black, with white margins. Young in down are dark buff, spotted on the upper parts with dark brown.



LARUS ROSSI*.

ROSS'S GULL.

Larus roseus, *Macgill. Mem. Wern. Soc.* v. p. 249 (1824).
Larus rossii, *Richardson, App. Parry's Second Voyage*, p. 359 (1825); **et auctorum plurimorum**—*Nuttall, Audubon, J. C. Ross, Swainson, Wilson, Thompson, Fischer, Alston, Cordeaux, Newton, Gould, Yarrell*, &c.
Rossia rosea (*Macgill.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 62 (1838).
Rhodostethia rossi (*Rich.*), *Macgill. Man. Brit. B.* ii. p. 253 (1842).
Rhodostethia roseus (*Macgill.*), *Bruch, Journ. Orn.* 1853, p. 106.

The claim of Ross's Gull to a place in the British list rests upon a single example, which is surrounded with some doubt. The alleged occurrence was first made known to British ornithologists by Mr. Charlesworth in 1847 (Proc. Yorks. Phil. Soc. i. p. 33). Sir William Milner also recorded it in the same year ('Zoologist,' p. 1694), and stated that the bird had been killed on the 22nd of December, 1846, by a Mr. Robinson of Saxton; but Mr. Henry Milner furnished the following particulars ('Zoologist,' 1847, p. 1784, footnote), which are quite at variance with those previously given. He states that the bird was killed, in February 1847, by a Mr. Horner, of Mitford in the parish of Kirby, in Yorkshire. These conflicting statements probably both originated with Graham, the York bird-stuffer, through whose hands the bird passed, and who may have purchased the skin from a Hull whaler. This example is in winter plumage, and is now preserved in the Leeds Museum. Macgillivray asserted that this species had occurred in Ireland; but there is not a particle of evidence in support of the statement.

There can be little doubt that Ross's Gull is a circumpolar species, breeding in the high north, beyond the Arctic circle. It was discovered by Ross in 1823, who obtained two examples on Melville Peninsula during the last week of June. It was also observed further west in Boothia. There are three examples in the Copenhagen Museum, obtained at Disco, in Greenland. Ross saw several during his journey over the ice north of Spitzbergen. One was obtained in Franz-Josef Land during the Austro-Hungarian expedition. No fewer than eight examples were shot by Mr. Newcomb on board the 'Jeanette,' on the north-east coast of

* There can be no doubt that *Larus rossi* is the proper name for this species. Macgillivray's earliest name was given provisionally "*Larus roseus*, pro tem.," and was afterwards withdrawn by himself, on the ground that Dr. Richardson had been commissioned, presumably by the discoverer, to describe it, which he accordingly did, naming it very properly after him.

Siberia; an example was obtained near the winter-quarters of the 'Vega,' on the coast of Tchuski Land; Mr. Nelson obtained a specimen in Alaska, and Mr. Ray procured it at Point Barrow. It has once occurred on the Faroes and once on Heligoland.

There are few birds whose habits are so imperfectly known as Ross's Gull. An inhabitant of the high north, it appears to wander very little from its ice-bound haunts; and, at most, it can only be classed as a gipsy migrant, appearing in more temperate climes at rare and uncertain intervals. Its breeding-grounds are still unknown, and its nest and eggs still remain a tempting prize, away in the mysterious icy north. Mr. Nelson met with this exquisitely beautiful Gull in Alaska and obtained one example. Mr. Newcomb, the naturalist on board the 'Jeanette,' shot several of these birds, and describes them as very graceful and buoyant on the wing. After the vessel was abandoned, and when the crew were making their way over the ice towards the Siberian coast, they met with a number of Ross's Gulls; but, unfortunately, they failed to record any of their habits. Of its food, note, nidification, &c., nothing is known.

Ross's Gull is a very aberrant Gull; its long, pointed, wedge-shaped tail shows an apparent affinity to the Skuas, but the narrow black collar round the neck of the adult bird points to an alliance with Sabine's Gull, and the delicate rose-coloured tint of the underparts is only an exaggeration of that on the Black-headed Gull and Roseate Tern. The head above the collar is nearly white; the rest of the upper parts are French grey, shading into white on the tail and on the tips of the greater wing-coverts and secondaries; the outer web of the first primary is dark brown, but none of the primaries have dark tips. The underparts are white, suffused with rose-colour on the breast and belly, and with French grey on the under wing-coverts. Bill black; legs and feet vermilion; orbits vermilion, surrounded with a narrow ring of black; irides hazel. Some examples are without the black collar, but it is not known whether this is a mark of adult winter plumage or of immaturity. Other examples, obviously immature, show a brown band across the wing-coverts and also across the tail. Nothing further is known of the changes of plumage of this species.

LARUS PHILADELPHIA.

BONAPARTE'S GULL.

(Plate 54.)

Sterna philadelphia, *Ord, Guthrie's Geogr.* 2nd Amer. ed. ii. p. 319 (1815); **et auctorum plurimorum**—*Coues, Baird, Brewer, and Ridgway, Saunders, Dresser*, &c.
Larus melanorhinchus, *Temm. Pl. Col.* no. 504 (1830).
Larus bonapartii, *Swains. Faun. Bor.-Amer.* p. 425, pl. 72 (1831).
Xema bonapartii (*Swains.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 62 (1838).
Chroicocephalus bonapartii (*Swains.*), Chroicocephalus subulirostris, *Bonap. fide* } *Bruch, Journ. Orn.* 1853, p. 105.
Gavia bonapartii (*Swains.*), Gavia subulirostris (*Bonap.*), } *Bonap. Naumannia*, 1854, p. 213.
Chroicocephalus philadelphia (*Ord*), *Lawr. B. N. Amer.* p. 852 (1858).
Larus philadelphia (*Ord*), *Gray, List Brit. B.* p. 235 (1863).

Bonaparte's Gull is another American species which accidentally visits the British Islands. The first example was killed as it was flying over the river Lagan, about a mile above the lowest bridge at Belfast, on the 1st of February 1848: the bird-stuffer to whom it was taken brought it to Thompson for inspection, and by him it was recorded (Newman, 'Zoologist,' 1848, p. 2069). A second specimen was shot about the end of April 1850, on the shore of Loch Lomond in Dumbartonshire (Sir George Leith, 'Zoologist,' 1851, p. 3117); it was identified by Yarrell, and was exhibited by Mr. Howard Saunders at a meeting of the Zoological Society on the 4th of March, 1884. A third is said by Yarrell to have been obtained on one of the English lakes (Brit. B. iii. p. 555), but no further particulars are given. A fourth, which was "pronounced by all the Natural History Societies of Dublin to be Bonaparte's Gull," was shot on the Irish coast, near the Skerries, on the 14th of February, 1855 (Powys, 'Zoologist,' 1855, p. 4762). A fifth was shot in Dublin Bay, in July 1864, by Mr. Blake-Knox ('Zoologist,' 1866, p. 306), but does not seem to have been sufficiently well identified. Two other examples were obtained, one at Falmouth Harbour on the 4th of January, and another on the 10th of the same month at Penryn, in 1865; whilst a third, now in the collection of Mr. F. Pershouse, of Torquay, was shot by him, early in November 1870, at St. Leonards in Sussex (Rodd, 'Zoologist,' 1865, p. 9501, and 'B. of Cornwall,' p. 168). Bonaparte's Gull does not appear ever to have been observed on any part of continental Europe; but, from its close resemblance to the Black-headed Gull, it may have been overlooked there, as well as in the British Islands.

Bonaparte's Gull is an inland species, and breeds in the semi-Arctic portions of North America, from Alaska to Labrador. It is not known to

breed north of the Arctic circle. It visits the Bermudas and the Southern States on migration, and winters in the Gulf of Mexico and on the coasts of California. It has no very near ally.

Bonaparte's Gull is a migratory species like its Old-World relative the Little Gull, and passes regularly along the coast as well as the inland "fly-lines" to and from its breeding-grounds in the north. Its migration north commences in April. It is said to arrive in South Wisconsin in that month, and to pass north very slowly and leisurely, as if inspecting the ground as it went. The immature birds, which have not yet begun to breed, make their appearance later, and do not migrate so far north as the nesting-colonies. Richardson says that it arrived very early near Great Bear Lake, before the snow was all melted, and sought for its food in the first pools of water that formed on the shore. It is said not to leave its winter-quarters in California until May. It appears to migrate early in autumn, going south in August and September.

In many of its habits Bonaparte's Gull very closely resembles the Black-headed and the Little Gulls, but in some of them it differs very considerably from either. It has the same easy graceful flight, more resembling that of the Terns than the large Gulls; and is said to be incessantly on the wing, every now and then plunging down into the water to capture a small fish. It is a very gregarious bird, and even in winter large flocks are observed feeding and flying in company. Like the Little Gull it glides and flutters in the air in pursuit of insects, or swoops down to the water and picks them from the surface. Audubon observed thousands of these beautiful Gulls hovering and flying over the waters of Chesapeake Bay, gradually proceeding eastwards, and keeping pace with the shoals of fish on which they were feeding. The notes of this bird are described by Dr. Cooper as sharp, but rather faint squeaks; and Audubon says that they are different from those of all other species, being much shriller and more frequently uttered.

One of the most peculiar and interesting facts in the history of Bonaparte's Gull is its singular manner of nesting. Although obviously so closely allied to the Little Gull and the Black-headed Gull, it seldom appears to make its nest on the ground in a swamp, but generally on tall trees and bushes. Perhaps it may only breed in trees in districts liable to sudden floods; for it was observed nesting in the marshes of Swan Creek by Mr. Gunn. MacFarlane, the collector who obtained so many eggs of rare birds for the Smithsonian Institution, found Bonaparte's Gull breeding in the wooded region near Fort Anderson. All the nests he saw were either on bushes or on trees, none being less than four feet, and others from fifteen to twenty feet above the ground. One which he found on the 23rd of June was built on a tree upwards of twelve feet from the ground, standing between two small ponds, and about thirty yards from

either. Another nest was made on the dry branch of a pine tree, about ten feet from the ground. Twenty-three nests described by MacFarlane were all in elevated situations, on stumps, bushes, or trees, and were made of sticks, lined with dry grass, and in some cases moss and lichen had been used; they were generally built on flat, horizontal branches at some distance from the trunk. He found eggs from the 10th of June to the 10th of July; the usual number of eggs was three, in rare instances four.

Kennicott found the nests of Bonaparte's Gull near Fort Yukon. One was built on the branch of a green spruce, near a lake, about twenty feet from the ground, and others were in similar positions, but on smaller trees. Richardson found this bird breeding in colonies in similar situations, some trees containing seven or eight nests, which were made of sticks. He states that it frequently perches on posts, and may often be seen standing on the summit of a spruce-fir. The eggs of Bonaparte's Gull vary in ground-colour from pale brown to dark brown and olive-brown, but the range of variation is not very great. The spots are generally evenly distributed over the surface of the egg, but occasionally they form a zone round the larger end; they vary in size from that of a small pea down to mere specks. The surface-spots are dark brown, and the underlying spots on those eggs where the ground-colour is pale are brownish grey and distinct, but where the ground-colour is darker they are greyish brown and indistinct. The eggs vary in length from 2·05 to 1·9 inch, and in breadth from 1·45 to 1·35 inch. Small eggs of the Black-headed Gull may easily be confused with large eggs of Bonaparte's Gull; but in a series the difference in size between the eggs of the two species is very conspicuous.

In winter, Bonaparte's Gull is almost exclusively a coast-bird; it is gregarious as in summer, and appears to be more shy than in the breeding-season. The food of this bird is composed largely of coleopterous insects, crustaceans, larvæ, and small fish. It appears to obtain its food at night as well as during the day.

Bonaparte's Gull is intermediate in size between the Black-headed and Little Gulls, but in the colours of its plumage it more closely resembles the former. It differs in having the hood of the adult in summer plumage greyish black instead of brownish black, in having the primary-coverts white instead of grey, in having white tips to the primaries, and in having a black instead of a red bill. In the changes of its plumage it does not differ from the Black-headed Gull; but the white tips of the primaries appear at the second autumn moult. Young in down are described as "of a dirty yellowish colour, thickly spotted [presumably on the upper parts] with dark brown."

LARUS RIDIBUNDUS.

BLACK-HEADED GULL.

(Plate 53.)

Larus gavia cinerea minor, *Briss. Orn.* vi. p. 178 (1760, winter plumage).
Larus gavia ridibunda phœnicopos, *Briss. Orn.* vi. p. 196 (1760, summer plumage).
Larus cinerarius, *Linn. Syst. Nat.* i. p. 224 (1766, winter plumage).
Larus ridibundus, *Linn. Syst. Nat.* i. p. 225 (1766, summer plumage); **et auctorum plurimorum**—*Naumann, Temminck, Yarrell, Dresser, Saunders,* &c.
Larus erythropus, *Lath. Gen. Syn. Suppl.* i. p. 296 (1787).
Larus canescens, *Bechst. Orn. Taschenb.* p. 370 (1803).
Larus capistratus, *Temm. Man. d'Orn.* ii. p. 785 (1820).
Xema ridibundus (*Linn.*), Xema capistratus (*Temm.*), *Boie, Isis*, 1822, p. 563.
Chroicocephalus capistratus (*Temm.*), *Eyton, Hist. Rar. Brit. B.* p. 63 (1836).
Chroicocephalus ridibundus (*Linn.*), *Eyton, Cat. Brit. B.* p. 53 (1836).
Gavia ridibundus (*Linn.*), Gavia capistratus (*Temm.*), *Bonap. Naumannia*, 1854, p. 213.
Larus cahirinus, *Hempr. & Ehr.*, Larus cahiricus, *Ehr.*, *fide Saunders, Proc. Zool. Soc.* 1878, p. 201.

The Black-headed Gull is one of the commonest species in this genus. Its colonies are not so large as those of the Kittiwake, but they are much more numerous. It is a resident in the British Islands, frequenting the coasts during winter, but retiring inland in summer to breed in colonies on swamps. In winter it is commoner on the English and Irish coasts than on those of Scotland; but from the nature of its breeding-grounds it is naturally much more abundant in summer in Ireland and in Scotland than in England. In spite of the greater population of the country, and the more extensive drainage of swamps, there are still many "gulleries" left in England, though it must be admitted that they owe their continued existence almost entirely to the pains taken to preserve them by the owners of the property where they occur. North of York the colonies are almost as common as they are in Scotland, but south of that city they are very few. There is one near Thorne in South Yorkshire, one near Brigg in Lincolnshire, and one near Norbury in Staffordshire, which was visited by Ray as long ago as 1662; there are two in the county of Norfolk (a very large and ancient one at Scoulton Mere, and a small and recent one near Hoveton), and there is one near Poole in Dorsetshire.

The Black-headed Gull is an inland species, breeding throughout the temperate portions of the Palæarctic Region. There is a colony on the Faroes, but it has not been recorded from Iceland or Greenland. It breeds

in South Norway and Sweden, Central Europe, the valley of the Danube, in Russia south of the Gulf of Finland, in Turkestan, and in South Siberia, and is an accidental visitor to Archangel. It has not been known to breed in Spain, and is principally known in the basin of the Mediterranean as a winter visitor, but there is a colony in Sardinia. It winters in the Red Sea, and in Northern India, China, and Japan. The nearest ally of the Black-headed Gull is the Adriatic Black-headed Gull (*Larus melanocephalus*), which differs in having the head jet-black instead of brownish black, the bill somewhat stouter, and by having little or no black on the margin of the inner web of the third primary at any age or season.

Gulleries were formerly much more numerous in England than they are now; in some instances the birds have deserted a favourite district in consequence of its having been reclaimed, but in others they have formed a new colony in the nearest suitable locality. Since the reclamation of Pilling Moss in Lancashire, for instance, the Black-headed Gulls that formerly bred there have emigrated to Cockerham Moss, about a mile distant. I am indebted to the Rev. J. W. Waithman for a water-colour drawing of the colony on Pilling Moss before it was deserted.

My friend Mr. W. Becher has sent me the following interesting particulars of the gullery at Twigmore, near Brigg, the property of Major Sutton:—"At the present time there are two pools, one of which is intersected by two small islands, connected to the mainland and to each other by hand-bridges, brushwood being laid where the ground is swampy. This latter was a favourite nesting-place for the Gulls. Part of the wild heath has been planted, within the last fifty years, with larch, oak, Scotch fir, and birch trees; several of the latter are dead, and on these the Gulls perch freely, as well as on the living trees. Last year a Gull built on a dead birch. This year I climbed up to a nest, some seven or eight feet from the ground, built in a dwarf Scotch fir standing on an island. There was also a nest on the sloping roof of the boat-house; but the majority were either on the bare ground or amongst the flags, and some were in a tuft of nettles. It was a very curious sight to see the Gulls perching on the roof of the boat-house as freely as Pigeons; and the hand-rail of the bridge would frequently be occupied by a row of birds mostly standing on one leg. The keeper tells me that he has seen Coots carry off the eggs of the Gulls in the same manner that a Crow does, with their bills stuck into the shells."

The most celebrated breeding-place of the Black-headed Gull in the British Islands is Scoulton Mere, not far from Hingham in Norfolk. The lake is entirely surrounded by plantations of oak, beech, Scotch fir, and spruce-fir. It covers about 150 acres; but 70 acres of this area are taken up with a large island upon which the gullery is situated. The colony consists of about 8000 birds, and is said to be gradually increasing in size.

Ten years ago it had dwindled down to less than half that number, in consequence of a succession of dry seasons and reckless shooting in the neighbourhood; but forty years ago the colony was estimated at upwards of 20,000 birds. In spite of these great numbers, the country round does not swarm with Gulls as might be expected. Half of them stop at home to sit on the eggs, the male taking his turn whilst the female is feeding; and the other half are scattered over two or three hundred square miles of ground. They fly far to feed, visiting the ploughed fields and the swamps within ten miles of home. In such places they may be seen in small parties of ten to thirty, catching small fish and frogs on the margins of the swamps and pools, or following the plough occasionally in the company of Rooks. So easily do they adapt themselves to changed circumstances, that they have already become used to the steam-plough. It is a very pretty sight to watch a party of these little Gulls looking snow-white in the distance against the rich brown of the newly turned-up soil, paddling amongst the clumsy clods with dainty red-webbed feet, and continually lifting their white wings to balance themselves on the rough ground, reminding the observer of a picture of a group of angels by Gustav Doré. When their appetites are satisfied they straggle home singly or in little parties of three or four, and towards evening they may be seen slowly winging their way to the mere, like tired Rooks flying home to the rookery.

When the colony is invaded the scene is very different. In winter they wander away to the coast, but early in March they revisit their breeding-grounds. On the 7th or 14th of April, according as the season is early or late, they have got their rough nests into shape and begin to lay. For the first few weeks all the eggs are systematically taken by the keeper and his men twice a week; but after the middle of May the anxiety of the proprietor not to kill the Goose that lays the golden eggs induces him to allow them to sit on the eggs subsequently laid and hatch them out. By the middle of June most of the eggs are hatched, and before the end of July both old and young disappear to seek new feeding-grounds. The part of the island where the Gulls breed consists of a few acres of swampy ground, thinly sprinkled over with flags and coarse grass, in which the nests are placed, and planted here and there with clumps of low birches and willows. When I visited this gullery in company with Mr. Bidwell, on the evening of the 13th of last May, the swamp was crowded with birds, which looked very conspicuous amongst the flag and sedge. As we neared the island thousands rose from the ground, and before we landed the air was one mass of birds, wheeling round and round in interlacing circles, whilst their cries were incessant. After selecting a few eggs we recrossed to the margin of the lake, and watched the seething mass of birds. It was a most animating sight. Sometimes a few hundred

birds alighted on the water, and the floating crowd, every bird with its black head to wind, rested on the surface for a few minutes and then rose again in a body. Sometimes a dozen or more perched on the crown of a small birch tree or on the slender twigs of the willows; then a few hundred birds would suddenly rise from the ground and swoop in a body over the surface of the water. Now and then a bird, presumably the owner of one of the nests we had robbed, flew almost close to us, with angry cries; and at any time by waving a hat we could fill the air with thousands of birds, the incessant cries ceasing for a moment as the birds rose, to be instantly resumed when they were fairly on the wing. The note of the Black-headed Gull at its breeding-grounds resembles that of the Common and Arctic Terns. Every modulation of the consonants *k* and *r* were produced, such as *kr, kr, kr,* or *kik, kik, kik,* varied to *kah, kah* and *kraw, kraw,* sometimes *kru, kru,* and often *kree-ah, kree-ah.* Occasionally the babel of thousands of voices was almost deafening. All the time fresh arrivals were seen coming over the trees from every direction, with steady beat of wing, white tail slightly expanded, and red legs stretched out under it, looking black against the snowy whiteness. Not unfrequently they skim over the tops of the trees with expanded motionless wings. The nests are very slight structures, mere depressions in the spongy ground, which bends beneath the weight of a person walking upon it. Occasionally the eggs are laid on the bare ground, but there is generally a lining of dead grass, sedge, or other weed.

In a colony of Black-headed Gulls on the island of Zealand, not far from Copenhagen, where the nests were partly placed on an island and partly in the lake, I noticed that those built on the water were large floating structures of reeds and horsetail partly supported by water-plants of various kinds, some of them even standing six or ten inches above the surface of the water, whilst those on the island were very slight, scarcely more than a mere lining to a depression in the grass. In another gullery which I visited on a lagoon on the Pomeranian coast, the nests were built on a floating island, and were large structures, as big as nests of the Coot. The Gulls were breeding in company with Common and Black Terns, and it was remarkable how much shyer they were than those birds. On the Lower Danube the nests were also floating on weeds of various kinds and were large. Although the colony was not a very large one, the birds were demonstrative enough, crying loudly, sometimes a single *kak,* at others *kak, kak,* frequently *kark,* and occasionally *kak, kark.* The Adriatic Black-headed Gull, which seems to be much more of a sea-bird, has quite a different note.

Very few birds are subject to greater variation in the colour of their eggs than the Black-headed Gull. They vary in number from two to three, and four are occasionally found. Sometimes the eggs in one clutch are very much alike; but occasionally one of the eggs is quite different from

the rest, both in the colour of the ground and in the style of spotting. Probably in the latter cases the odd egg has been laid by a different bird. The eggs of the Black-headed Gull vary in ground-colour from pale bluish green to greyish buff and brown, spotted, blotched, and streaked, in almost every conceivable variety, with surface-markings of dark brown and with underlying markings of greyish brown. On some eggs the spots are much darker than on others, and occasionally, but apparently only where the ground-colour is pale bluish green, they are absent or nearly so. They differ greatly in shape and size, varying from 2·45 to 1·95 inch in length, and from 1·55 to 1·35 inch in breadth. The eggs of the Black-headed Gull are indistinguishable from those of the Laughing Gull. Both male and female assist in the duties of incubation, and but one brood appears to be reared in the year.

In winter the Black-headed Gull is a coast-bird, and frequents estuaries, low-lying shores, and lagoons; but it sometimes wanders inland at this season, for Capt. Shelley observed it far up the Nile in large flocks, following and preying upon a swarm of locusts. In India it frequents the large rivers and inland lakes as well as the coast. It is as gregarious as in the breeding-season, and large flocks often follow the shoals of fish for days. The food of the Black-headed Gull is composed of insects of various kinds, worms, small fish, crustaceans, &c. It feeds as greedily on wire-worms as the Rook, and is very useful to the farmer in ridding the land of many insect pests.

The Black-headed Gull in full breeding-plumage has a sooty-brown hood, which extends to the throat, but not to the nape; the mantle, scapulars, wing-coverts, and innermost secondaries are French grey; the primaries are white, tipped with black, and the longest more or less margined with black; the rest of the plumage (including a ring round the eye) is pure white, frequently suffused with rose-colour on the breast. Bill, orbits, legs, and feet blood-red; irides hazel. This plumage is acquired in March; the brown head is assumed in a fortnight, by a change of colour and not by a moult, and it is not known that any of the other feathers are moulted. The bird probably breeds when it is nearly two years old, but the amount of white on the primaries increases at each successive autumn moult for several years afterwards. After the autumn moult, which takes place in August, and probably extends to every feather, the brown hood disappears, except a patch on the lores and another on the ear-coverts, and there are occasionally a few streaks on the hind head. After the first spring moult, which is possibly confined to the scapulars and innermost secondaries, the brown hood is more or less mottled with white, and further signs of immaturity are to be found in brown streaks on the wing-coverts, the greater amount of brown on the primaries, and in a more or less imperfect brown band at the end of the tail. Birds of the year (a

dress which begins to be assumed almost as soon as the first plumage is complete) show additional signs of immaturity in having the scapulars and innermost secondaries brown with pale edges, the colours of the bill and feet are much duller, and the head is white suffused with brown. Young in first plumage have the feathers on the mantle also brown with pale edges; the crown, nape, and ear-coverts are brown, the subterminal broad brown bar of the tail is very distinct, and the bill, feet, and orbits are flesh-coloured. Young in down are buffish brown, paler on the underparts, and spotted on the upper parts with blackish brown.

Three other Black-headed Gulls have been included in the British list. Saunders has conclusively shown (Yarr. 'Hist. Brit. B.' ed. 4, iii. p. 606) that the story of an example of the Laughing Gull (*Larus atricilla*), an American species, having been shot near Winchelsea in August 1774, and having formed part of the collection of Col. Montagu, and being now in the British Museum, is a fable. The bird described by Montagu was an immature example, probably of the Black-headed Gull, certainly not of the Laughing Gull; whilst the bird in the British Museum is a nearly adult example of the later species, and therefore could not possibly be the specimen described by him. The committee of the 'Ibis List,' with their accustomed carelessness, took no pains to correct such an obvious blunder. The egg is figured on Plate 52.

The only evidence for the admission into the British list of the Adriatic Black-headed Gull (*Larus melanocephalus*) is that of an example purchased for the British Museum from Mr. Whitely of Woolwich, who stated that it was shot, in January 1866, near Barking Creek. An accidental change of label, either at the British Museum or on Mr. Whitely's part, is the probable explanation. The egg is figured on Plate 53.

It seems probable that a single example of the Great Black-headed Gull (*Larus ichthyaetus*) was shot in the spring of 1859 in the estuary of the Exe in Devonshire (Ross, 'Zoologist,' 1860, p. 6860). The specimen is an adult in full breeding-plumage, and is now in the Exeter Museum. It is an eastern species, breeding from the basin of the Caspian eastwards to Mongolia, wintering from the valley of the Nile to Assam. It has not occurred on the island of Heligoland. Its egg is figured on Plate 53.

LARUS CANUS.

COMMON GULL.

(Plate 52.)

Larus gavia cinerea major, *Briss. Orn.* vi. p. 182 (1760).
Larus canus, *Linn. Syst. Nat.* i. p. 224 (1766); **et auctorum plurimorum**—*Gmelin, Naumann, Schlegel, Dresser, Saunders,* &c.
Larus cinereus, *Scop. Ann. I. Hist. Nat.* i. p. 80 (1769).
Larus hybernus, *Tunst. Orn. Brit.* p. 3 (1771).
Larus procellosus, *Bechst. Orn. Taschenb.* ii. p. 373 (1803).
Larus cyanorhynchus, *Meyer, Taschenb.* ii. p. 480 (1810).
Larus heinei, *Homeyer, Naumannia,* 1853, p. 129.
Glaucus canus (*Linn.*), *Bruch, Journ. Orn.* 1853, p. 102.
Gavina heinei (*Homeyer*), Gavina canus (*Linn.*), *Bruch, Journ. Orn.* 1855, pp. 283, 284.

The Common Gull breeds in various parts of Scotland and Ireland, both on the coasts and inland, extending to the Orkneys, the Shetlands, and the Outer Hebrides. To England it is only a winter visitor, though five-and-twenty years ago it bred near Fleetwood, on the coast of Lancashire, where my friend Mr. Holdsworth has taken its eggs. In the extreme north of Scotland it migrates south in winter, and at that season is common on the greater part of the English coasts, frequently wandering far inland in open weather.

The Common Gull breeds only in the northern portion of the Palæarctic Region, from the Atlantic to the Pacific. In Europe it is not known to breed south of the Baltic*; in Scandinavia it breeds as far north as land extends; but in East Russia and West Siberia it is only found south of lat. 68°, and in East Siberia it is not known to range north of lat. 64°. It passes through the valley of the Amoor, Mongolia, Lake Baikal, and Turkestan on migration, and winters on the coasts of Japan, China, and the Caspian Sea, and has once occurred in the Persian Gulf. The West-European birds are principally resident, though many of them pass down the coast as far as Gibraltar; but in North-east Europe they are migratory, and winter in the Black Sea and the basin of the Mediterranean.

Siberian examples of this species are separated as *Larus canus niveus*, on

* Degland and Gerbe state that the Common Gull breeds on the rocky coasts of Northern France; but they have probably confounded it with the Kittiwake. Henke says that it breeds in great numbers on the Khirghiz Steppes, and Radde states that it breeds commonly near Lake Baikal; but both these writers are probably in error, as Dybowsky says that great numbers pass through the neighbourhood of Baikal to breed further north, though large flocks of immature non-breeding birds remain throughout the summer.

the ground of their larger size and slightly darker mantle; but every intermediate form occurs. On the Pacific side of America the Common Gull is replaced by a nearly allied species, *L. brachyrhynchus*, and on the Atlantic side of that continent by *L. delawarensis*, the former slightly smaller and the latter slightly larger than the European bird, and differing also in some other particulars.

The Common Gull is intermediate in its habits between the inland and marine species; it breeds indifferently on an island off the coast or on the cliffs of the mainland, and is equally satisfied with an island on an inland lake or the banks of a mountain-tarn. It is equally catholic in its choice of a feeding-ground. It often catches fish in the sea or picks up marine insects on the shore; it is fond of following the plough in search of worms and grubs; it catches fish in rivers, lakes, and sometimes in tarns at a considerable height above sea-level; and Naumann says that young birds and mice have been found in its stomach. Its flight is easy and graceful, but not very rapid. Its notes are loud and harsh and considerably varied: some resemble the syllable *kyah*, others *kak*. It is more or less gregarious in its habits, and is generally seen in flocks, sometimes in very large ones, but occasionally it feeds singly or in pairs. The same remarks apply to its breeding-colonies; some of these are very large, others small, and in many places, especially on the coast, its nests may be found scattered here and there along the shore. The nest is carelessly constructed of dead grass and other weeds, and is generally placed on the ground, either in a rocky niche, on dry sandy earth, or in swampy grass or moss, and a clump of sedge or a bunch of heath are often chosen. It is most often found, especially where the colonies are large, in flat open country; but a grassy ledge on the face of a cliff or on the top of the rocks is frequently selected; and in Norway Collett has known it to breed in the deserted nest of a Hooded Crow near the top of a pine, not far from a lake. The Common Gull occasionally perches in lofty trees, generally choosing the summit or a dead branch. In the valley of the Yenesay I shot one of these birds after having watched it for some time perched on a branch of a larch. Naumann made the same observation in Germany, and Collett says that he repeatedly saw them perch on the tops of trees in Norway.

Newly laid eggs may be obtained during the last half of May in Scotland; but north of the Arctic circle I have taken fresh eggs in the middle of June both in Norway and in Siberia. Three is the usual number. They are subject to very little variation. The ground-colour varies from olive-brown to buffish brown. The spots are seldom larger than a pea, but occasionally very irregular in shape, and sometimes elongated into streaks; they are generally most abundant on the large end, but occasionally evenly distributed over the egg. The surface-spots are dark brown, sometimes approaching black, and the underlying spots, which are seldom very distinct, are brownish

grey. The eggs vary in length from 2·35 to 2·1 inch, and in breadth from 1·7 to 1·6 inch. The eggs of the Common Gull are not very easily confused with those of any other British Gull. Only one brood is reared in the year.

The Common Gull in breeding-plumage may be regarded as a small edition of the Lesser Black-backed Gull; but the colour of the mantle is slightly paler, the pattern on the primaries is less distinct, and the yellow of the bill, legs, and feet is always more or less suffused with green. After the autumn moult the head and neck are streaked with greyish brown, as they are in its larger ally. After the second autumn moult, which begins very early, the only signs of immaturity left are the absence of the white subterminal spot on the primaries, and traces of the bar across the end of the tail. After the first autumn moult the bird only differs from young in first plumage in having a few adult feathers on the back and wing-coverts; but, with the exceptions above named, the immature feathers are slowly moulted into adult plumage in the following spring during the four months of March to June. Young in first plumage have the greater wing-coverts as in the adult, the rest of the small feathers of the upper parts being brown with pale edges, those of the underparts white with pale brown edges, the tail-feathers with a nearly terminal broad black band, and the bill, legs, and feet are brown. Young in down are greyish buff, mottled with black on the upper parts.

COMMON GULL.

LARUS FUSCUS.

LESSER BLACK-BACKED GULL.

(Plate 51.)

Larus griseus, *Briss. Orn.* vi. p. 162 (1760).
Larus fuscus, *Linn. Syst. Nat.* i. p. 225 (1766); **et auctorum plurimorum**—*Naumann, Temminck, Dresser, Saunders,* &c.
Larus flavipes, *Meyer, Taschenb.* ii. p. 469 (1810).
Lencus fuscus (*Linn.*), *Kaup, Natürl. Syst.* p. 86 (1829).
Dominicanus fuscus (*Linn.*), *Bruch, Journ. Orn.* 1853, p. 100.
Clupeilarus fuscus (*Linn.*), *Bonap. Consp.* ii. p. 220 (1857).
Larus argentatus, *Gmel. apud Montagu, Leach, Forster,* &c.

The Lesser Black-backed Gull is a resident in the British Islands. In Scotland, and in England north of the Tyne, it breeds both on the islands of inland lakes and on the coasts of the mainland. In the Orkneys it is a resident, but to the Shetlands, the Hebrides, and to the extreme north of the mainland it is only a summer visitor. Immature birds are seen on the rest of our coasts at all times of the year; but during the breeding-season the distribution of the adult birds is very local south of the Tyne. There are no breeding-places on the east coast south of the Farne Islands, and none on the south coast east of Devonshire. On the west coast it breeds in various localities in Wales, Devonshire, and Cornwall. In Ireland very few breeding-places are known.

The Lesser Black-backed Gull has a very restricted range, being confined to the shores of Western Europe and North Africa. There is no reliable evidence that it ever occurs in the White Sea; but it breeds throughout the coasts of Scandinavia, the shores of the Baltic and the North Seas, the coasts of France and Spain, and the shores of the Mediterranean, Black, and Red Seas. In the extreme north of its range it is a migratory bird, and wanders in winter as far as the Canaries and the coasts of West Africa. There is no reliable evidence of its having occurred as far east as the Caspian Sea *.

The Lesser Black-backed Gull has no ally nearer than *Larus occidentalis*, which is confined to the Pacific coast of North America from Vancouver's Island to Lower California, and which is a slightly larger bird, with a stouter bill, flesh-coloured legs, and larger feet.

* Dresser, in his 'Birds of Europe,' represents the distribution of this Gull as extending to the Pacific. It is much to be regretted that in his articles on the Siberian and Yellow-legged Herring-Gulls he had not the courage to correct his previous blunders.

The Lesser Black-backed Gull spends most of its time on the sea-shore, feeding upon fish and small marine animals of all kinds. It is not so wild as the other large Gulls; and though it has a more powerful and graceful flight, it is less timid, and allows itself to be approached within easy gun-shot. It may sometimes be seen in small parties following the plough to pick up worms and grubs, and occasionally it visits the meadows near the coast. It feeds on the scattered grain in sowing-time, and frequents the stubbles after harvest for a similar purpose. It often visits harbours and docks, where it is very tame, flying close to the ships, and picking up all kinds of refuse from the stagnant water. It often sits lightly on the heaving waves, swims with ease, and even sleeps on the water. It is gregarious both in summer and winter, and at the latter season large flocks often congregate at the mouths of rivers or in quiet bays to fish or to rest. A mudbank or a low promontory is a favourite resting-place for this Gull.

The Farne Islands have been noted for the number of kinds of sea-birds which have bred upon them for more than two hundred years. Of these the Lesser Black-backed Gull is by far the most numerous; and it is rather remarkable that it should have been omitted from the list of sea-fowl enumerated by Willughby and Ray as breeding upon those islands. This may probably be explained as an accidental error of the printer; for of the five kinds of Gulls and Terns catalogued (Willughby and Ray, 'Ornithology,' p. 18), No. 4 (which may have been the Lesser Black-backed Gull) is omitted. It is scarcely correct to say that there are now numerous colonies of these birds on the Farne Islands; the whole group of islands may be regarded as a huge colony of Lesser Black-backed Gulls. It is a wonderful sight on approaching an island to see the green mass sprinkled all over with large white-looking birds, every one standing head to wind, like an innumerable army of white weather-cocks; and it is still more wonderful, when a shot is fired, to see the flutter of white wings as every bird rises in haste, and to hear the angry cries which each bird makes as soon as the exertion of getting fairly launched into the air is over, and it finds breath enough to scream defiance to the invader of its home. In half a minute thousands of birds are flying backwards and forwards in every direction, like a living snowstorm. The various cries of the birds almost exactly resemble those of the Herring-Gull. The angry *kyeok* (which sounds at a distance, when the birds are quarrelling, like *ak, ak, ak*) and the good-natured call-note, *ha, ha, ha*, or *an, an, an*, are constantly heard.

The nests are placed in various positions. Many of the islands are bare rocks, which generally rise gradually from the sea on one side and drop almost perpendicularly into it on the other; and wherever a suitable niche occurs, a large slatternly nest is placed in it, composed of dry grass and the dead leaves of the various marine plants which grow on the neighbouring

islands, frequently mixed with a bunch or two of seaweed. On other islands the nests are built on the grass, and occasionally almost hidden in the masses of bladder campion, which grows in great profusion in many places. Three is the usual number of eggs in each nest, but on the Farne Islands they are robbed so repeatedly that when they are at last (it used to be the 18th of June) allowed to finish breeding in peace, very few nests contain the full clutch. The eggs vary much in size, shape, and colour. The shell varies from pale bluish green to almost white, and from greyish buff through pale brown to dark brown. The surface-spots are rich dark brown, sometimes approaching black, and the underlying spots are brownish grey. On some eggs the spots are very small and evenly distributed over the entire surface; on others they are large blotches and very few in number: they are usually largest and most numerous at the large end, where they often form a semi-confluent zone. In rare instances the spots assume the form of fantastically shaped streaks and blotches. The eggs vary in length from 2·8 to 2·4 inch, and in breadth from 2·0 to 1·7 inch. It is very important that eggs of this species should be carefully identified, as many of them are indistinguishable from those of the Herring-Gull.

In winter the Lesser Black-backed Gull wanders far from its usual summer haunts; it becomes a nomad, working round the coast, following the shoals of fish, sometimes visiting inland ponds or following the course of large rivers.

The Lesser Black-backed Gull is not quite so large as the Herring-Gull, but more than twice the size of the Common Gull or the Kittiwake. The progress to maturity in this group of Gulls is much slower than in the Black-headed Gulls. The adult Lesser Black-backed Gull in summer plumage has the entire head, neck, the whole of the underparts, the upper tail-coverts, and the tail pure white; the back and wing-coverts are dark slate-grey; the longest scapulars and the innermost secondaries are tipped with white; the quills are nearly black, with white tips, and the longest primaries have also a subterminal white spot. Bill yellow, with a vermilion patch on the angle of the lower mandible; legs and feet yellow; orbits vermilion; irides pale yellow. After the autumn moult the head and nape are streaked with dull brown. The adult plumage is not assumed until after the fourth autumn moult. After the third spring moult the absence of the white subterminal spot on the longest primaries betrays the immaturity of the bird; after the third autumn moult additional signs of immaturity present themselves in a few brown markings on the wing-coverts and tail; after the second spring moult the absence of the vermilion spot on the lower mandible and the flesh-coloured feet and orbits are further marks of immaturity; after the first spring moult, which apparently proceeds so slowly that it blends with the second autumn moult, all the signs of immaturity to be found in first plumage are reproduced, except that

the colour is much paler. Young in first plumage have a slate-grey bill, flesh-coloured legs, feet, and orbits, and brown irides; all the feathers of the upper parts are brown, with pale edges, which are broadest and whitest on the head and rump; the upper tail-coverts and tail are white barred with brown, the bars on the latter becoming confluent towards the tip; the quills are dark brown, and the underparts are white streaked with brown. This plumage is very slightly moulted in the first autumn. Young in down are greyish buff, shading into white on the belly, distinctly spotted with black on the head and throat, and obscurely spotted with dark brown on the rest of the upper parts.

BLACK-HEADED GULL'S NEST.

LARUS MARINUS.

GREAT BLACK-BACKED GULL.

(Plate 52.)

Larus niger, *Briss. Orn.* vi. p. 158 (1760, adult).
Larus varius, } *Briss. Orn.* vi. p. 167 (1760, juv.).
Larus skua, }
Larus marinus, *Linn. Syst. Nat.* i. p. 225 (1766); **et auctorum plurimorum**—*Naumann, Temminck, Dresser, Saunders*, &c.
Larus maculatus, *Bodd. Tabl. Pl. Enl.* p. 16 (1783).
Larus maximus, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 40 (1816).
Lencus marinus (*Linn.*), *Kaup, Natürl. Syst.* p. 86 (1829).
Dominicanus marinus (*Linn.*), *Bruch, Journ. Orn.* 1853, p. 100.

The Great Black-backed Gull is a resident in the British Islands, but in the breeding-season it is principally confined to the vicinity of rocky coasts or mountain-lakes. It is consequently much more common in Scotland than in England, and is not known to breed on any of the low-lying coasts of the eastern counties.

The Great Black-backed Gull is an oceanic species, principally confined to the North Atlantic. On the European coast its most southern breeding-locality is North-west France, thence it breeds further north on the shores of the German Ocean and the Baltic Sea, as far north as the North Cape, and as far east as the delta of the Petchora. In winter it occasionally strays as far as the Canary Islands, Madeira (a few probably remaining in the latter locality to breed), and the basin of the Mediterranean. It breeds on the Faroes, in Iceland, and in Greenland as far north as lat. 68°. On the American continent it breeds in Labrador, and possibly on the islands of some of the great lakes south of the Arctic circle and east of the Rocky Mountains, as it has occurred in Alaska. In winter it visits the Southern States of America and the Bermudas; but some of the Alaska birds appear to winter on the coasts of Japan *.

* It is possible that the Gulls from Alaska which have been identified as Great Black-backed Gulls (Nelson, 'Cruise of the Corwin,' p. 107) may prove to be *L. schistisagus*; but there can be no doubt that the examples of *L. marinus* from Japan, in the Swinhoe collection, have been correctly identified. American ornithologists have not yet examined the Gulls of Alaska. Baird, Brewer, and Ridgway (Water-Birds of N. Amer. ii. p. 234) write of the Siberian Herring-Gull—"Seebohm states that it is described as not being uncommon at St. Michael's in Alaska, but this requires confirmation." My authorities are Dall and Bannister (Trans. Chic. Ac. Sci. i. p. 305), where *Larus borealis* is said to be "not uncommon at St. Michael's, and plenty at Plover Bay," which is partially confirmed by Nelson ('Cruise of the Corwin,' p. 107), who remarks that "these birds were found to be numerous at Plover Bay."

In the southern hemisphere, south of the tropics, it is represented by *Larus dominicanus*, a bird with a stouter bill, a browner back, and greener legs and feet. In the Behring Sea a still closer ally occurs, *Larus schistisagus*, which appears to be an intermediate form between *L. marinus* and *L. affinis*, if it be not an accidental variety of the latter.

The Great Black-backed Gull is the largest species of Gull, and consequently the most wary. It does not differ much in its habits from its oceanic allies, but it is perhaps more exclusively oceanic than they are, often wandering far from land, frequently sleeping on the waves, and rarely straying inland far from the shore, except where the coast offers it no breeding-place secure enough from danger. No Gull is more difficult to approach within range, nor takes greater pains to build its nest in inaccessible places. It seems always afraid of being killed or robbed, and yet it is itself one of the greatest murderers and robbers of the coast. It is the scavenger of the shore, and may be seen lazily searching for dead fish or other carrion, or slowly flying out to sea, its long broad pinions steadily and deliberately moved like those of a Heron or an Eagle, to pick up any offal that may be floating on the water. Sometimes it may catch a fish which has ventured too near the surface; and no marine animal, from a crab to the smallest shell-fish, is safe from its beak. In the breeding-season it steals Terns' and Plovers' eggs from the strand, and even robs the ledges where the Guillemots and Fulmar Petrels breed, sticking its powerful bill into the eggs, or snapping up the young birds before they can fly. In districts where the Eider Duck breeds, it is looked upon as a great enemy, and persecuted accordingly. It is scarcely so gregarious as the other species of Gull; nothing is more common than to see solitary birds, and flocks larger than from half a dozen to a dozen birds are rarely met with. Even in the breeding-season it is less sociable than other Gulls: on the coast of Norway I rarely found more than one nest on an island; but in districts where secure nesting-places are scarce, it is obliged to become gregarious. An inaccessible rock on the coast, with a flat top covered with grass, is the situation it likes best; but if such cannot be found, it will satisfy itself with an island on a lake, and to obtain such a comparatively secure position for its nest it often wanders far inland. Like those of all other Gulls, the nests of this bird are carelessly made, and are little more than a depression in the grass or heath, or even a niche in the bare rock, roughly lined with dead grass, seaweed, and occasionally ornamented with a twig or two round the edge, or a few feathers or sheep's wool in the middle. North of the Arctic circle I have taken fresh eggs during the first half of June, but in Scotland the first eggs are laid a month or more earlier. A full clutch of eggs is three, but two are not unfrequently found. They vary very slightly, and are usually greyish brown in ground-colour, sometimes very slightly tinged with olive, and

occasionally pale brown. The spots are seldom much larger than a pea, often very irregular in shape, sometimes elongated into streaks, and, as a rule, evenly, but sparingly, distributed over the surface, though it is not uncommon to find eggs where they are more abundant on the large end. The surface-spots are dark brown, and the underlying spots brownish grey. The eggs vary in length from 3·2 to 3·0 inch, and in breadth from 2·2 to 2·0 inch. The eggs of the Great Black-backed Gull are on an average larger than those of any other British Gull; but small examples are indistinguishable from those of the Glaucous Gull and from large examples of the Herring-Gull.

At the nest the Great Black-backed Gull is a wary bird, and seldom allows itself to be approached within shot, unless it has young. Its notes are loud and harsh, almost as hoarse and quite as unmusical as those of the Raven. Its alarm-note might be represented by the syllable *kyaouk*, and its call-notes as *ag, ag, ag*. In winter these birds often congregate where fishing-operations are being carried on.

The Great Black-backed Gull is about twice the weight of the Lesser Black-backed Gull, but differs from it very slightly in colour. The mantle is darker, the legs and feet are flesh-colour instead of yellow, but the colour of the bill, irides, and orbits is the same in both species. So far as is known, the changes of its plumage are the same as those of the Lesser Black-backed Gull.

LARUS ARGENTATUS.

HERRING-GULL.

(Plate 51.)

Larus cinereus, *Briss. Orn.* vi. p. 160 (1760); *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 40 (1816).
Larus argentatus, *Gmel. Syst. Nat.* i. p. 600 (1788); **et auctorum plurimorum**—*Temminck Naumann, Baird, Brewer & Ridgway, Dresser, Saunders,* &c.
Larus argenteus, *Macgill. Mem. Wern. Soc.* v. p. 264 (1824).
Glaucus argentatus (*Gmel.*), *Bruch, Journ. Orn.* 1853, p. 101.
Laroides argentatus (*Gmel.*), *Bonap. Naumannia,* 1854, p. 212.
Larus smithsonianus, *Coues, Proc. Ac. Philad.* 1862, p. 296.
Larus fuscus, *Linn. apud Pennant, Montagu, Forster,* &c.

The Herring-Gull is commonly distributed round the British coasts, and breeds in more or less abundance in most suitable localities. It nests on many of the cliffs on the south and west coasts of England, including the Channel Islands, as well as on the rocky shores of Wales. On the east coast it breeds sparingly on the Flamborough cliffs and the Farne Islands, and thence it has many colonies on the mainland and adjoining islands round the Scotch coast, including the Orkneys and Shetlands, the Outer Hebrides and St. Kilda. It breeds in many suitable localities round the coasts of Ireland.

The Herring-Gull is an Atlantic species, in the New World breeding in British North America as far north as the Arctic circle, and as far west as the Great Slave Lake. It winters in the United States east of the Rocky Mountains, and in Mexico, the Bermudas, West Indies, and Central America, apparently (like the Arctic and Gull-billed Terns) only crossing to the Pacific coast in Central America. To Greenland it is a somewhat rare visitor, but it breeds on the Faroes, Azores, Madeira, and Canary Islands. In the Old World its range is comparatively restricted, being confined to North-west Europe. It breeds on both coasts of Scandinavia as far east as the Varanger Fjord, and in many places on the shores of the North Sea and the English Channel. In all these localities it is more or less a resident; but it is said that many birds, mostly immature, migrate in winter to the west coasts of France and Spain, and pass along the north-west coast of Africa as far south as the Canaries.

The Herring-Gull has two very close allies, which appear to be conspecific with it. The most distinct of these, *Larus argentatus affinis*, breeds in the Arctic regions of Siberia, from the White Sea to Behring's

Straits, across which it ranges into Alaska*, passes through the Caspian on migration, and winters in the Arabian Sea. Accidental stragglers on migration have been obtained in Greenland, on Heligoland, in the Black Sea, and in the Sea of Ochotsk. This species is very distinct from the Herring-Gull, having a dark slate-grey mantle and yellow legs. It is, however, connected with it by an intermediate subspecies, *L. argentatus cachinnans*, which appears to intergrade with both the extreme forms. In the colour of the mantle it is exactly intermediate between its two allies, but its legs are yellow, like those of the Siberian bird. This intermediate form is a resident in the Mediterranean and Black Seas, and ranges eastwards through the Caspian and Aral Seas, to Lake Baikal and the valley of the Amoor. The Asiatic birds are migratory, and visit the coasts of Arabia, India, China, and Japan in winter. It is said also to breed in Alaska; "but this requires confirmation."

The Herring-Gull is a resident in the British Islands, but it is more widely distributed in winter than in summer, when it is concentrated in the districts that are suitable for nesting-purposes. As in almost all Gulls, the young birds are the greatest wanderers, and it is of them that the large flocks seen on the low-lying coasts in autumn and winter are principally composed. In winter flocks of this Gull often wander inland to lakes and reservoirs, or follow the course of large rivers; it is then often seen in large flocks on the wide extensive mud-flats at the mouths of rivers, and is very fond of frequenting harbours. Its habits do not differ very much from those of the other large Gulls. Like most big birds it is rather shy, and seldom allows any one to approach very closely. The Herring-Gull has received its commonest trivial name from the pertinacity with which it follows the shoals of herrings. The presence of this fish off the coast is unerringly proclaimed by the actions of the Herring-Gull. Like a huge clumsy Hawk, it hovers above the shoal, every now and then dropping to the water and capturing a fish; or, skimming along just over the surface of the waves, it stoops, letting down its feet so as almost to touch the water, and picks one up without alighting. The flight of this bird is slow and somewhat laboured; the long wings are beat slowly to and fro in a regular Heron-like manner, and the bird is not so capable of turning and twisting as the smaller Gulls and the Terns. A flock not unfrequently rises to a great height, wheeling round and round as Rooks occasionally, and Vultures habitually, do. The Herring-Gull often alights on the ground, where it walks about very gracefully, and it not unfrequently settles on the water, either to fish or to rest; it is very fond of standing on one leg, and often lies down.

No bird attends the fishing-boats more closely than the Herring-Gull,

* See footnote on p. 323.

and few sights are more interesting than to watch them in a fluttering throng, rising and descending, turning and twisting like huge animated snowflakes. Every scrap of offal that is thrown overboard, especially the small fish, is eagerly pounced upon and secured, often before it reaches the water. The Herring-Gull is almost omnivorous in its diet. It greedily feeds on carrion, and, like the Hoodie and the Raven, it rarely fails to put in an appearance at a decaying carcass of a sheep or a horse, when near the coast, to share the prize. It eats garbage and offal of all kinds, and is a determined robber of eggs, being only rivalled in this respect by the hated "Farspach," as the Great Black-backed Gull is called in the Hebrides. Its food is also composed of small fish, crustaceans, mollusks (which it sometimes breaks by dropping them from a considerable height on the rocks), and the numerous marine animals cast up by the tide. In sowing-time it not only follows the plough for worms, grubs, and insects, but it eats the scattered seed, and also repairs to the fields in harvest to pick up the grain. It is said to frequent the places where the fishermen spread their nets, to pick out of the meshes the numerous small marine creatures that are entangled. It is rather pugnacious when feeding, and often compels the Crows, Ravens, or smaller Gulls to yield up a tempting morsel.

The call-note of the Herring-Gull resembles the syllables *hă-hă-hă*, or more exactly *hăn-hăn-hăn*; the alarm-note resembles the syllables *ky-eok*, pronounced in a guttural manner, and when the bird is unusually excited its note is rapidly repeated and sounds like *kăk-ăk-ăk*.

At the end of April the Herring-Gull returns to its accustomed breeding-place, and nest-building commences at once, the eggs being laid early in May. Fresh eggs may be obtained through this month. The Herring-Gull breeds both on lofty inaccessible cliffs as well as on flat ground. Generally the latter situation is only chosen on islands or in little-frequented districts. A few pairs of Herring-Gulls generally breed in most of the colonies of Lesser Black-backed Gulls; sometimes only one or two pairs nest together, but occasionally the colony is large. It prefers to build its nest on the grassy ledges when a cliff is selected; but when on low islands it either builds in a hollow in the ground, in a crevice of a rock, or on the grass close to the edge of the cliffs. The nests are often large bulky structures, made of tufts of half-dry grass and masses of seaweed, and lined with fine grass and a few straws or stalks of the sea-campion. Sometimes they are very slight—mere hollows, scantily lined with dry grass. The nests are often placed close together. In America the Herring-Gull frequently makes its nest in trees. In 1833 Audubon found it breeding on an island in the Bay of Fundy, making its nest in the almost inaccessible spruce-trees; and nearly twenty years later Brewer confirmed the observation. Audubon was told

that the birds had adopted this singular mode of nesting within the memory of his informant, and that many years previously they built on the ground. Nests found by Kennicott, on the southern shores of the Great Slave Lake, were deep and large and made of sticks, leaves, and feathers, and generally hidden amongst low bushes, or near drift-wood and under willows.

The eggs of the Herring-Gull are usually three in number, but sometimes only two. The typical eggs of this Gull are indistinguishable in colour from eggs of the Common and Great Black-backed Gulls, but many other varieties are found which do not occur in either of those species. Some eggs are pale bluish green with only a few small brown specks upon them, whilst others, in which the ground-colour is dark buffish brown, are not very uncommon. Occasionally the surface-spots are as large as a sixpence. The eggs vary in length from 3·0 to 2·7 inch, and in breadth from 2·1 to 1·9 inch. Eggs of this Gull should be very carefully identified, otherwise they are of little or no value.

When the colony is invaded the sitting Gulls quit their nests at the first alarm, long before the intruder has approached, and with angry cries of remonstrance circle in the air above his head, or alight on the neighbouring rocks to watch his movements. Should the young be hatched the anxiety of the old birds is increased, and the downy chicks run and hide themselves amongst the grass or in the crevices of the rocks. The young that are hatched in trees are said not to leave the nests until they can fly, but those bred in nests on the ground soon take to the water. It is not known that the Herring-Gull rears more than one brood in the year; but its first clutch of eggs (even the second and third) is very often taken, when others are laid. As soon as the young are able to fly the breeding-place is deserted, and old and young disperse round the coasts for the winter, the latter generally keeping much to themselves.

The Herring-Gull is on an average a slightly larger bird than the Lesser Black-backed Gull. The colour of the mantle, scapulars, and wing-coverts is much paler than in that bird, being light French grey; and the grey wedge-shaped pattern on the inner web of the primaries is much more developed, being quite distinct on the first primary. The colour of the bill does not differ; but the legs and feet are flesh-colour instead of yellow, and the orbits are yellow instead of vermilion; the irides are the same in colour. The Herring-Gull is believed to carry its immature mottled plumage a year longer than the Lesser Black-backed Gull, and in all the stages of immature plumage its colours are much paler than in that species. Young in down are indistinguishable from those of the Lesser Black-backed Gull.

LARUS GLAUCUS.

GLAUCOUS GULL.

(Plate 50.)

Larus glaucus, *Brünn. Orn. Bor.* p. 44 (1764); *Fabr. Faun. Grœnl.* p. 100 (1780); **et auctorum plurimorum**—*Naumann, Temminck, Dresser, Saunders,* &c.
Larus giganteus, *Temm. fide Benicken, Ann. Wetter. Gesellsch.* iii. p. 140 (1812).
Larus leuceretes, *Schleep, Neue Ann. Wetter. Gesellsch.* i. p. 314 (1819).
Larus consul, *Boie, Isis,* 1822, p. 875.
Larus islandicus, *Edmonston, Mem. Wern. Soc.* iv. p. 506 (1823).
Larus glacialis, *Macgill. Mem. Wern. Soc.* v. p. 270 (1824).
Lencus glaucus (*Brünn.*), *Kaup, Natürl. Syst.* p. 86 (1829).
Larus hutchinsii, *Richardson, Faun. Bor.-Amer.* ii. p. 419 (1831).
Plautus glaucus (*Brünn.*), *Reich. Nat. Syst. Av. Longip.* p. v (1852).
Glaucus consul (*Boie*), *Bruch, Journ. Orn.* 1853, p. 101.
Laroides glaucus (*Brünn.*), *Bruch, Journ. Orn.* 1855, p. 281.

Although Linnæus and Brisson appear to have been unacquainted with the Glaucous Gull, it was described and named by Brünnich before the publication of the twelfth edition of Linnæus, but after the appearance of Brisson's great work. It was first included in the list of British birds by Dr. Edmonston, who obtained an example in 1822 on one of the Shetland Islands. It is only a winter visitor to the British Islands, appearing somewhat irregularly. As might be expected, it is much more common in Scotland than in England or Ireland. It has, however, occurred on almost every part of the English coast, and has been known accidentally to stray some distance inland.

The Glaucous Gull is a circumpolar bird, breeding in the Arctic Ocean on the shores of both continents. Its only known breeding-station in Norway is at Vardö, in the extreme north-east. It also breeds on Nova Zembla, Iceland, Spitzbergen, and Greenland, where it has occurred as far north as lat. 82°. In winter it visits the Baltic and North Seas. Further south it must be regarded as an accidental straggler, occasionally wandering to the Mediterranean and Black Seas. In the Pacific it visits in winter the Kurile Islands and Japan on the west coast, but has not been known to occur further south than Alaska on the east coast. On the Atlantic coasts of America it strays in winter as far south as Long Island.

The Glaucous Gull is very nearly allied to the Iceland Gull, and is also connected with *Larus glaucescens* through *L. nelsoni*. So far as is known, the latter species is confined to Alaska; it appears to be a western form of *L. kumlieni*, from which it scarcely differs, except in its larger size.

The habits of the Glaucous Gull are very similar to those of the Iceland Gull. The two birds frequent almost precisely similar localities, and both are gipsy migrants, seldom wandering far from their summer-quarters so long as food is obtainable. Dr. Edmonston gave a very complete account of the habits of the Glaucous Gull as observed by him in Shetland. He says it loves to frequent the mouths of the exposed bays, or the open sea a few miles from land, where it attends the fishing-boats to feed on the refuse that is thrown overboard. So greedy is it in its search for food that it is often taken by a hook baited with fish. It is described as preferring carrion to other food, and like the Vultures, when engaged in feeding, as often quite indifferent to the approach of danger. In winter the Glaucous Gull congregates into large flocks which feed in company. Edmonston observed that they went regularly out to sea to feed at a particular period of the tide, and then returned nearer the land to rest. It is rather a pugnacious bird, and often robs other species of their prey, whence it is often called the Burgomaster.

The Glaucous Gull is almost omnivorous in its diet. It feeds on small fish, offal, garbage of all kinds, crustaceans, birds, and small mammals. A Gull of this species has been known, when shot at, to disgorge a Little Auk it had swallowed entire; and it was afterwards found to have another in its stomach. Dr. Malmgren once saw one of these birds swoop down like a Hawk and capture a young Black Guillemot, carrying it to a neighbouring rock, where numerous skeletons of birds bore witness to its rapacity. It is very fond of frequenting the colonies of sea-birds, and carries off great numbers of their young.

The Glaucous Gull breeds on the cliffs at Vardö, and a large flock, composed principally of immature and entirely of non-breeding birds, frequents the stretches of sand left at low water near Vadsö, thirty miles to the south of the breeding-colony. When I was at this town, the Glaucous Gulls were always to be seen at all hours flying about the harbour; but by far the greater portion of them retired to a distant sandbank, which extended from the southern promontory of the island in the Varanger Fjord, apparently to roost, as the sun approached the north. They were very noisy before finally settling down to rest, continually uttering their loud and harsh note, which may be represented by the syllables *cut-luk*. Although at Vardö the Glaucous Gull breeds on the precipitous cliffs, Harvie-Brown and I afterwards found its nest on one of the low flat islands which separate the lagoon of the Petchora from the Arctic Ocean. This island is a flat desert of sand unrelieved by a blade of grass, and rises very slightly above the level of the sea, which varies very little (only five or six inches) with the tide. As we approached the island we found a large flock of Glaucous Gulls upon it, but were only able to discover two nests; these were heaps of sand hollowed slightly at the apex, and lined with

some irregularly disposed tufts of seaweed. It was the 13th of July, and unfortunately the eggs had all hatched; but we shot four old birds, and secured half a dozen young in down, which were running about on the sand. The parents were very bold, and made repeated downward swoops upon us; the rest of the flock kept well out of range, soon settling down on a point at the extreme end of the island, and on being fired at there, flew right away.

At its other breeding-places, the Glaucous Gull, like the Ivory Gull and the Iceland Gull, sometimes makes its nest on the sand like a Tern, and sometimes on ledges of the cliffs like a Kittiwake. The nest is a very careless structure, generally composed of dead grass and seaweed, and three appears to be the full complement of eggs, which are usually laid during the first half of June. They vary in ground-colour from pale brown to pale olive-brown and pale bluish green. The surface-spots are dark brown, occasionally approaching black, and the underlying spots are brownish grey. The spots vary in many eggs from the size of a pea downwards, and are nearly evenly distributed over the surface; but occasionally they are large bold blotches, principally collected round the large end of the egg, and often confluent. A very handsome variety, presumed to be of this species, is obtained at Vardö. The ground-colour is pale brick-red; the overlying spots are dark brick-red, and the underlying spots are violet-grey. Occasionally the spots are well-defined, but generally they are obscure and distributed over the surface. The eggs vary in length from 3·3 to 2·8 inch, and in breadth from 2·1 to 1·9 inch. Eggs of the Glaucous Gull are indistinguishable from those of the Great Black-backed Gull, and small examples resemble large eggs of the Herring- and Lesser Black-backed Gulls.

The Glaucous Gull is almost as large as the Great Black-backed Gull. Adults in breeding-plumage have the mantle, scapulars, and wing-coverts a delicate French grey; the rest of the plumage is pure white. Bill yellow, with an orange-red spot on the angle of the lower mandible; legs and feet flesh-colour; orbits vermilion in fully adult birds, but pale flesh-colour during immaturity; irides very pale straw-yellow. After the autumn moult the head and neck are streaked with grey. It is not known how old the Glaucous Gull is when its adult plumage is assumed; but in the spring preceding the final autumnal moult into adult winter dress, a mottled plumage is acquired, of so pale a character that it fades during the summer into a creamy white, and in rare instances into pure white. The intermediate plumages are white, mottled with brown, the darkest being that of young in first plumage, which closely resembles that of the Herring-Gull, but is still paler, especially on the primaries. Young in down are grey, sparingly and obscurely mottled with black on the back.

LARUS LEUCOPTERUS.

ICELAND GULL.

(Plate 51.)

Larus leucopterus, *Faber, Prodr. isl. Orn.* p. 91 (1822); et auctorum plurimorum —*Naumann, Temminck, Audubon, Dresser, Saunders*, &c.
Larus glaucoides, *Temm. fide Boie, Isis*, 1822, p. 562.
Larus arcticus, *Macgill. Mem. Wern. Soc.* v. p. 268 (1824).
Glaucus leucopterus (*Fab.*), *Bruch, Journ. Orn.* 1853, p. 101.
Larus chalcopterus, *Licht. Nomencl. Av.* p. 99 (1854).
Laroides leucopterus (*Fab.*), Laroides chalcopterus (*Licht.*), *Bruch, Journ. Orn.* 1855, pp. 281, 282.
Leucus arcticus (*Macgill.*), Leucus chalcopterus (*Licht.*), Leucus leucopterus (*Fab.*), *Bonap. Consp.* ii. pp. 216, 217 (1857).

The Iceland Gull was unknown to Brisson or Linnæus, but appears to have been discovered in 1818, in Greenland, by Capt. Sabine, who was persuaded by Temminck to regard it as an Arctic variety of the Herring-Gull. Temminck soon found out his error, and named the new species *Larus glaucoides*; but in the meantime Faber had discovered the bird in Iceland, and called it *Larus leucopterus*, a name by which it is universally known. Simultaneously with its discovery in Greenland and Iceland, Dr. Edmonston, of Shetland (by whom the Ivory Gull and the Glaucous Gull were added to the British list), was trying to obtain examples of a large and of a small white-winged Gull which the natives assured him frequented the coast. In 1822 he succeeded in obtaining an example of the larger species (the Glaucous Gull), which he named *Larus islandicus*; but it was not until 1823 that he obtained an example of the smaller species, when, finding that the larger species had already been named and described, he proposed to transfer the name which he had given to the larger species to the smaller one. Although we must adopt Faber's name, we must do Dr. Edmonston the justice to admit that he was the first naturalist to discover that the Iceland Gull was a British bird.

This species is only a winter visitor to our shores and one which appears with great irregularity. Like the Bohemian Waxwing, it is a gipsy migrant, and occasionally occurs in unusual numbers. Early in January 1873 it

appeared in large flocks, in company with the Glaucous Gull, in the Firth of Forth, as well as off the coast of Cornwall. In England it is of rarer occurrence than in Scotland, and it is supposed to be still rarer in Ireland. Most of the examples obtained on our coasts are in immature plumage.

The Iceland Gull is only a winter visitor to Iceland. It is believed to be strictly a Nearctic bird, breeding from Alaska and the Aleutian Islands in the west, to Greenland in the east, and most probably in various localities on the intervening coasts of Arctic America. In the Pacific it wanders in winter as far as Japan and California, and in the Atlantic as far as Labrador, the Faroes, and Iceland, and visits the shores of the North Sea and the Baltic. It has occurred once or twice on the north coasts of France; a single example was obtained in Nova Zembla; and Middendorff believed that he saw it on the Taimur peninsula.

The Iceland Gull is a very near ally of the Glaucous Gull, but appears also to be connected with *Larus glaucescens* through the newly discovered *L. kumlieni*. The latter species has all the appearance of being a hybrid between the two, and breeds in Cumberland Bay on the west side of Davis Strait, wintering on the coasts of the Northern States. It may always be distinguished by having some pale slate-grey on both webs of the first primary, on the outer web of the second primary, and across the tips of the third and fourth primaries, where it forms a subterminal bar.

The Iceland Gull is practically a resident in the Arctic regions. At the approach of winter it wanders southwards, the immature birds, as is usually the case, going the furthest from home. Probably the old birds seldom wander further from their breeding-grounds than open water, since, wherever the sea is free from ice, they find abundant food. Faber, who has published the best account of this species, stated that the Iceland Gull arrived on the coasts of Iceland about the middle of September; they remained through the winter, but decreased in numbers towards the end of April, and by the end of May they had nearly all left the coasts and retired to the high north again. In its winter-quarters it frequents small fjords and inlets. Faber says that they were remarkably tame, and came near the dwellings of the inhabitants to fight with the Ravens for the scraps of food thrown from the houses. It is gregarious and hunts for food, sometimes in large flocks, following the seals to pick up the small fish which these animals disturb. They are also said to follow in the wake of codfish for a similar purpose; and by the movements of these Gulls the Icelanders are made aware of the appearance of that fish off their coasts. In its flight the Iceland Gull closely resembles its congeners. Sometimes it rises to a great height, and soars round and round, or not unfrequently hovers just above the sea, with head bent downwards, eagerly looking out for food, and often pouncing down to the water with outstretched legs and fluttering wings to pick up something

floating on the surface. Occasionally great numbers congregate on the floating pieces of ice, probably to rest or sleep, and are thus drifted for miles. It often swims, and alights on the water to rest.

The Iceland Gull feeds on almost anything. It catches the small fish that swim near the surface, and eats all kinds of refuse thrown from the houses; it also feeds on crustaceans, and Saxby noticed its partiality for vegetable food. In the Shetlands he often saw it searching for food near the pigs, and he took oats, vegetable fibres, and small pieces of quartz from its stomach. Saxby says that the note of the Iceland Gull somewhat resembles that of the Common Goose, but it has a character of its own; and Audubon remarks that its notes are not so loud nor so frequently uttered as those of the Herring-Gull.

Of the habits of the Iceland Gull in the breeding-season but little has been recorded. Dr. Walker observed it breeding on the high cliffs that fringe the shore of Bellot's Strait in Arctic America; MacFarlane procured several clutches of its eggs in July on the Arctic coast of America; Dall found this Gull breeding abundantly in Alaska, and states that the eggs were laid from the 5th to the 10th of June. It appears to make its nest either on the tall beetling cliffs that skirt the Arctic Sea or on the sandy beaches. The nests found by Dall were small depressions in the sand; but when on the cliffs a more substantial structure is doubtless provided. The eggs appear to be three in number, when the full clutch is laid, and vary in ground-colour from pale greyish buff to buffish brown and pale olive. The surface-markings, varying in size from a large pea to a speck, vary also from rich brown to pale brown in colour, and are pretty evenly distributed over the entire surface of the egg. The underlying markings are large, numerous, and conspicuous, and are violet-grey. Some eggs are much more boldly marked than others, the spots being often confluent and forming an irregular zone round the large end. They vary in length from 2·85 to 2·5 inch, and in breadth from 1·93 to 1·8 inch. It is impossible to distinguish the eggs of the Iceland Gull from those of the Lesser Black-backed Gull and the Siberian Herring-Gull (*L. affinis*). Eggs of the Common Herring-Gull resemble them closely, but are on an average slightly larger and richer in colour. It is not known that the Iceland Gull rears more than one brood in the year.

In winter it often congregates into large flocks, young and old birds mixing indiscriminately. At this season its habits are said closely to resemble those of the Herring-Gull; but it is said by Audubon to venture further up rivers and creeks and to be less shy than that bird.

The Iceland Gull is about the size of the Lesser Black-backed Gull. In the colour of its plumage, and in the changes dependent upon age and season, it is not known to differ in the slightest respect from the Glaucous Gull except that in fully adult birds the orbits are flesh-coloured instead

of vermilion*. According to Saunders the Iceland Gull has proportionally longer wings than the Glaucous Gull.

* This difference in the colour of the orbits is pointed out by Naumann, and by Baird, Brewer, and Ridgway, but is not mentioned by Saunders. Dresser describes the orbits of the Glaucous Gull as vermilion, but colours them white; and he appears to be incorrect both in his figure and description of those of the Iceland Gull. Respecting the colour of the legs and feet authorities appear to differ. In both species they are normally flesh-coloured; but Naumann says that very old birds of the Glaucous Gull have pale yellow legs, whilst Baird, Brewer, and Ridgway say that very old examples of the Iceland Gull often have orange-red legs. Dresser describes the legs of both species as flesh-coloured, but figures those of the larger one yellow, and of the smaller pink.

LARUS EBURNEUS.

IVORY GULL.

(Plate 50.)

? Larus albus, *Gunner, Leem. Beskr. Finm-Lapp.* p. 285 (1767).
Larus eburneus, *Phipps, Voyage towards the North Pole*, p. 187 (1774); **et auctorum plurimorum**—*Gmelin, Schlegel, (Baird, Brewer, & Ridgway), (Newton), (Dresser), (Saunders)*, &c.
Larus candidus, *Müller, Prodr.* p. viii (1776).
Larus niveus, *Bodd. Tabl. Pl. Enl.* p. 58 (1783).
Gavia eburneus (*Phipps*), *Boie, Isis*, 1822, p. 563.
Pagophila eburnea (*Phipps*), *Kaup, Natürl. Syst.* p. 69 (1829).
Cetosparactes eburneus (*Phipps*), *Macgill. Man. Brit. B.* ii. p. 252 (1842).
Larus brachytarsus, *Holb. Faun. Grœnl.* p. 52 (1846).
Pagophila brachytarsa (*Holb.*), *Bruch, Journ. Orn.* 1853, p. 106.
Gavia brachytarsa (*Holb.*), *Bonap. Consp.* ii. p. 230 (1857).
Gavia alba (*Gunn.*), *Stejn. Pr. U. S. Nat. Mus.* 1882, p. 39.

Although the Ivory Gull was discovered in Spitzbergen as long ago as 1671, by Martens, who visited those islands in a whaling-ship, it was not honoured with a Latin name until upwards of a century later, when Commodore Phipps, afterwards Lord Mulgrave, bestowed upon it the name it now bears. It appears to have been figured for the first time in the celebrated 'Planches Enluminées,' under the name of "Le Goilande blanc du Spitzberg."

The Ivory Gull is one of the very few birds which are residents in the Arctic regions, and is only a rare straggler to the British Islands. As might naturally be expected under these circumstances, it occurs more frequently in the north than in the south. The first recorded British example was obtained by Dr. Edmonston in the winter of 1822, on the most northerly of the Shetland Islands (Saxby, 'Birds of Shetland,' p. 332). Since that date it has occurred several times on these islands as well as on the Orkneys, perhaps a score times in different parts of Scotland, nearly as often in England, in most cases on rocky coasts, but only twice in Ireland. It is a somewhat remarkable fact that of the examples obtained in the British Islands nearly the same number were in adult as in immature plumage.

Except perhaps on the icy shores of Greenland, the Ivory Gull does not probably breed more than a thousand miles from the North Pole. Within this limit, wherever land has been found, the Ivory Gull has been observed during the breeding-season—in Spitzbergen, Franz-Josef Land, Nova

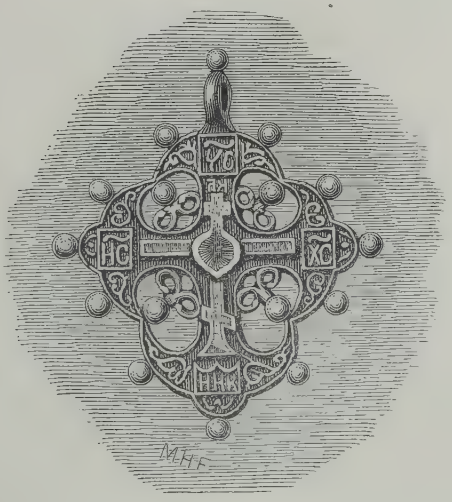
Zembla, Bennett Island, Herald Island, the Parry Islands, and Grinnell Land. In winter it occurs more or less accidentally as a straggler to the coasts of Norway, Labrador, Newfoundland, and has occurred as far south as Denmark, Germany, Holland, France, and Switzerland. It has not been recorded from the Pacific; but Nordenskiöld found it in the winter-quarters of the 'Vega,' not far within Behring's Straits.

The Ivory Gull, or Snow-bird, as it is often called, spends most of its time amongst the ice, and is frequently found on the pack-ice at a considerable distance from land. It is almost omnivorous in its diet. Saxby watched an Ivory Gull for some time swimming about and feeding on the fry of the coal-fish. Capt. M'Clintock found the remains of lemmings round a nest of the Ivory Gull, and also fresh pellets consisting of their hair and bones. Mr. Kumlien examined the stomachs of several examples, which he found to contain small crustaceans. Nordenskiöld remarks that Ivory Gulls were often seen sitting for a long time round a seal-hole, in order to feed upon the excrements; and its taste for the flesh of the seal and whale, for blubber, and for garbage of all kinds is well known to whalers and other Arctic voyagers. Like the other Gulls, it spends a great portion of its time on the wing, picking up most of its sustenance without alighting on the waves, but is occasionally seen swimming on the surface in places where its food is very abundant. It is described as a ravenous eater, and as very fond of attending the whalers and walrus-hunters to feed upon the scraps of fat and flesh. Its cry is described as a loud and disagreeable scream.

The Ivory Gull generally breeds in colonies on inaccessible cliffs. Dr. Malmgren obtained its eggs in Spitzbergen on the 7th of July, 1861, where it was breeding on the side of a steep limestone precipice several hundred feet high, in company with the Kittiwake and the Glaucous Gull. The nests were shallow depressions in the soil, carelessly lined with dead grass, moss, other weeds, and a few feathers. M'Clintock found it breeding at Prince Patrick's Island, the most westerly of the Parry Islands, south-west of Grinnell Land. Two of the nests were built on low islands, and a third was on a bare patch of gravel near the beach. They were almost entirely composed of moss, and one of them contained, in addition, a little white down and a few feathers. The egg obtained by M'Clintock is in the Museum of the Royal Dublin Society; two eggs obtained by Malmgren are in the Stockholm Museum; and a third is in the collection of Mr. Benzon in Copenhagen. No other authentic eggs are known to exist. It is not known that the Ivory Gull lays more than one egg. The specimen in the Dublin Museum measures 2·45 inch in length, and 1·7 inch in breadth; the ground-colour is buffish olive, and the surface-markings, which are distributed over the entire shell, are dark brown and pale brown, and the underlying markings, which are very large and conspicuous, are

violet-grey. The eggs appear to resemble those of the Kittiwake in colour, but those of the Common Gull in size.

The Ivory Gull is about the size of the Kittiwake, but rather less than the Common Gull. When adult, both in summer and winter, the Ivory Gull deserves its name, the entire plumage being pure white; bill greenish grey, yellow at the tip; legs and feet black; irides hazel; orbits vermilion. Immature birds have black spots on the lesser wing-coverts, primary-coverts, the edge of the wing, and on the tips of the quills and tail-feathers. Birds still more immature have black spots also on the mantle, scapulars, and innermost secondaries. Young in first plumage are said to be an almost uniform dark French grey, but very little is known of the immature stages of plumage of this species. Young in down appear to be undescribed.



LARUS TRIDACTYLUS.

KITTIWAKE.

(Plate 50.)

Larus gavia cinerea nævia, } *Briss. Orn.* vi. pp. 185, 189 (1760).
Larus gavia hyberna, }
Larus rissa, *Linn. Syst. Nat.* i. p. 224 (1766, adult).
Larus tridactylus, *Linn. Syst. Nat.* i. p. 224 (1766, juv.) ; et auctorum plurimorum —*Gmelin, Schlegel, Naumann*, (*Dresser*), (*Saunders*), &c.
Larus albus, *P. L. S. Müller, Natursyst. Suppl.* p. 108 (1776).
Larus nævius (*Briss.*), *Schäff. Mus. Orn.* p. 64 (1789).
Gavia tridactylus (*Linn.*), *Boie, Isis*, 1822, p. 563.
Rissa brunnichii, *Steph. Shaw's Gen. Zool.* xiii. pt. i. p. 181 (1825).
Larus torquatus, } *Pall. Zoogr. Rosso-Asiat.* ii. pp. 328, 329 (1826).
Larus gavia, }
Cheimonea tridactylus (*Linn.*), *Kaup, Natürl. Syst.* p. 84 (1829).
Rissa cinerea, *Eyton, Cat. Brit. B.* p. 52 (1836).
Rissa tridactyla (*Linn.*), *Gray, List Gen. B.* p. 79 (1840).
Rissa kotzebui, *Bonap. Consp.* ii. p. 226 (1857).
Larus tridactylus, *var.* kotzebui (*Bonap.*), *Coues, B. of N.-W.* p. 646 (1874).
Rissa tridactyla pollicaris, *Baird, Brewer, & Ridgway, Water-Birds N. Amer.* ii. p. 202.

The Kittiwake is one of the most abundant of the British Gulls, but as it is exclusively a rock-bird, its colonies are confined to certain districts. There is no part of the British coasts that it does not visit during the time that it is not engaged in nesting-duties. In summer its chief resorts on the east coast of England are at Flamborough and the Farne Islands ; on the south its colonies are principally on the iron-bound coasts of Cornwall, Devon, and the Scilly Islands ; and on the west it breeds in considerable numbers along the rocky coasts of Wales and on the Isle of Man. It is abundant and generally distributed on all the rocky portions of the Scotch coasts, extending to the Orkney and Shetland Islands, the Hebrides, and the islands of the St.-Kilda group. In Ireland it is equally common, and breeds abundantly, especially on the wild southern and western coasts. To the Channel Islands it is only known as a winter visitor.

The Kittiwake is a circumpolar bird, breeding on the coasts of the Arctic Ocean, and on Iceland, the Faroes, Spitzbergen, and Nova Zembla. In the Atlantic its breeding-range extends along the coast of Norway as far south as lat. 62°, south of which there appear to be no breeding-stations except those on the British Islands and on the rocky coasts of Brittany. In Asia it breeds as far south as the Kurile Islands, and on the west coast

of the Pacific as far south as the Aleutian Islands. On the west coast of the Atlantic it is not known to breed further south than Labrador. It winters in the Azores, Madeira, the Canaries, on the coasts of Spain, and in West Africa as far south as Senegal, and visits the Mediterranean, but not in great numbers, as far east as Malta. Examples are sometimes obtained inland in stormy weather; and it has occurred in the Black and Caspian Seas and in Egypt. In the Pacific it occasionally strays in winter as far as Japan on the west coast, but its winter range on the American coast is unknown. On the Atlantic coast of America it is found as far south as Virginia and the Bermudas at that season.

On the coasts and islands of Behring's Sea a nearly allied species, *Larus brevirostris*, occurs, which differs in having a shorter and redder bill and red legs and feet. Both in *Larus brevirostris* and *L. tridactylus*, from Behring's Sea, examples are occasionally found with a more or less developed hind toe.

The Kittiwake is strictly a sea-bird, and only very rarely visits inland districts, when it is driven from its usual haunts by storms. It is practically a resident on the British coasts, but numbers apparently wander southwards in winter, and many colonies are deserted at that season. Macgillivray infers that it is a migrant, arriving in the end of March and leaving in October; but Gray states that considerable numbers are to be seen throughout the winter. In St. Kilda the Kittiwake is said to arrive during the first half of April and to leave in August. Round the English coast it is more or less abundant all the winter, and at that season visits many localities where it is unknown in summer.

In its habits the Kittiwake does not differ much from the other oceanic Gulls. It seldom, if ever, visits the fields near the coasts, always preferring the water. It is a very sociable bird, and breeds in colonies; in winter it is quite as gregarious, and flocks of these charming birds may often be seen feeding far out at sea. In many of its actions it resembles the large Terns, and obtains much of its food in a similar manner. It hovers above the water over the myriads of tiny fish, then plunges suddenly down, the spray almost hiding it for a few moments, then rises again with its long wings raised above its back. Saxby observed that, when fishing, it always plunges to windward, and never with its back to the wind. In this manner it works its way along the shoal of fish, coming out on the weather-side, then returns with a wide sweep and renews the search. Sometimes it skims along just above the surface of the sea, or glides and wheels in graceful curves, swoops downward, poises, or hovers like a Kestrel. Like the Fulmar, the Kittiwake seems perfectly at home in a gale of wind, and often turns completely round, when hovering, as if on a pivot. The Kittiwake seldom walks far, and generally sits on the rocks wher it has alighted until it takes wing again. It often rests on the sea,

sleeping on the heaving billows with its bill buried in its dorsal plumes. It swims easily and lightly, and often alights on the water to eat its food. The large Gulls often mob the gentle Kittiwake and rob it of its hard-earned prey.

The food of the Kittiwake consists principally of small fish; it also eats crustaceans, small shell-fish, and other marine animals, and picks up various floating refuse from ships. It is very sharp-sighted, and often pounces down from a considerable height to secure a small fish. The note of the Kittiwake is almost too well known to need description. Like the Cuckoo, this little Gull has received its trivial name from its singular notes, which resemble the syllables *kitti-aa, kitti-aa,* which the imagination often likens to *get away, get away,* especially in the neighbourhood of its nest. This note is modulated in various ways, as the birds converse amongst themselves, as it were, on the cliffs.

The most interesting period of the Kittiwake's life is when it is engaged in the duties of rearing its young. A Kittiwake-colony is one of the most charming sights a rock-bound coast can afford. Early in spring the birds return to their old nurseries, visiting them almost daily until the work of building or restoring the nests commences. The places this Gull prefers are steep cliffs—rocks which fall sheer down to the water—on the ledges and shelves of which it places its somewhat well-made nest. If the cliffs are tenanted by other sea-birds the Kittiwakes usually select the lowest parts of the rocks, often making their nests a few feet from the water; but in other situations where they have the rocks to themselves they utilize every suitable situation. Every year the Kittiwakes return to the old familiar cliffs to rear their broods, and from time immemorial certain rocks have been favoured. These colonies vary considerably in size: sometimes a cliff has only one or two pairs nesting upon it; on others the range of rocks is white with the clustering masses of birds.

The largest colony of birds which I have ever seen is that at Svœrholt, not far from the North Cape, in Norway, on the cliffs which form the promontory between the Porsanger and the Laxe Fjords. It is a stupendous range of cliffs, nearly a thousand feet high, and so crowded with nests that it might easily be supposed that all the Kittiwakes in the world had assembled there to breed. The number of birds has, however, been grossly exaggerated. If we estimate the surface of the cliff covered by the nests at about 640,000 square feet, and allow for each nest a foot in width and two feet and a half in height, we obtain a total of (say) a quarter of a million nests, or half a million breeding birds. Supposing the non-breeding birds to be ten to one, surely a very high estimate, we only reach five and a half million birds. When a recent writer says that "the number of individuals must amount to milliards," or thousands of millions, he is simply talking unmitigated nonsense, and obviously has no conception of what a milliard

is. One milliard Kittiwakes laid in a row, and touching one another, would reach twenty times round the world! But, in spite of all this tall talk, the number is incredible. It is the custom to fire off a cannon opposite the colony: peal after peal echoes and re-echoes from the cliffs, every ledge appears to pour forth an endless stream of birds, and long before the last echo has died away it is overpowered by the cries of the birds, whilst the air in every direction exactly resembles a snowstorm, but a snowstorm in a whirlwind. The birds fly in cohorts: those nearest the ship are all flying in one direction, beyond them other cohorts are flying in a different direction, and so on, until the extreme distance is a confused mass of snowflakes. It looks as if the fjord was a huge chaldron of air, in which the birds were floating, and as if the floating mass was being stirred by an invisible rod. The seething mass of birds made an indelible impression on my memory; it photographed itself on my mind's eye, as such scenes often do. I tried to make a sketch of it at the time, but I found it impossible to convey the idea of motion. It reminded me of Gustav Doré's picture to illustrate the passage in Dante's 'Inferno' of "the punishment of sinners, who are tossed about ceaselessly in the air by the most furious winds." No less an artist than Doré could do justice to such a scene. There is a much smaller colony at Stappen, just beyond the North Cape, which made a great impression upon me, until it was partially effaced by its still more impressive rival.

The Kittiwake's nest is better made than is usual with the Gulls. In some districts the foundation is made of turf, with the soil adhering, which the salt spray and wet feet of the birds soon turns into a kind of mortar. This foundation is finished off into a nest made of seaweed, pieces of marine vegetation, and finally lined with dry grass and sometimes a few feathers. The Kittiwake's nest is a very dirty structure outside, and, with the adjoining cliff, is usually whitewashed with the droppings of the birds. The nests are often placed very close together, and almost every little jutting piece of rock is crowned with one. The eggs of the Kittiwake are two or three in number, but in some cases four are laid; they vary in ground-colour from pale greenish blue and olive-brown to pale buff and buffish brown, spotted and blotched with rich reddish brown and with underlying markings of pale brown and grey. On some eggs the spots are small and evenly distributed over the whole surface, but on others the blotches are large and confluent and form an irregular zone round the large end. Some specimens are very sparingly marked with a few large blotches here and there. The underlying markings are numerous, large, and very conspicuous, and on some eggs are the preponderating ones, the surface-spots being only represented by a few indistinct blotches or dark-brown streaks. The eggs vary in length from

2·25 to 2·0 inch, and in breadth from 1·68 to 1·5 inch. The eggs of the Kittiwake are not easily confused with those of any other British species.

As soon as the colony is invaded the birds set up an anxious chorus of cries, and soon the air is filled with birds, mildly protesting against the unwelcome intrusion on their haunt. Many birds remain quietly sitting on their nests in spite of the disturbance, only quitting them as the adventurous climber approaches. When the young are able to fly the nurseries are soon deserted, and the birds lead a more or less nomad life, wandering far to the south in the course of the winter. Of the ruthless slaughter of these charming birds, often when their helpless young are lying in the nests, nothing here need be said, beyond condemning it in the strongest terms.

The Kittiwake is rather smaller than the Common Gull, and may always be distinguished by the absence of the hind toe. In its general coloration the adult Kittiwake in breeding-plumage bears a considerable resemblance to the Common Gull and to the winter plumage of the Black-headed Gull, but differs in the colour of its primaries, which are French grey, paler towards the broad black tips; the outer web of the first primary is black, and many of the primaries have a small white tip beyond the black. Bill greenish yellow; legs and feet brown; irides hazel, orbits orange. After the autumn moult the crown and ear-coverts are streaked with dark grey, and the hind neck is pale French grey. After the second autumn moult the outer webs of the second and third primaries are more or less black, but not to the same extent as that of the first primary. After the first autumn moult further signs of immaturity are observable in the black bill, the black collar on the hind neck, the great amount of black on the lesser wing-coverts and the innermost secondaries, and in the black bar at the end of the tail. Young in first plumage are further distinguished by having the crown and nape dark grey, and by having brown margins to the feathers of the back. Young in down have the head and underparts white, tinged with buff on the flanks, and the rest of the upper parts pale grey.

Genus STERCORARIUS.

The Skuas were included by Linnæus in his genus *Larus*; but in 1760 Brisson adopted the genus *Stercorarius* for their reception in his 'Ornithologia,' vi. p. 149, Richardson's Skua, *S. richardsoni* (the *Stercorarius stercorarius* of Brisson), being the type.

The Skuas may be distinguished from the Gulls and Terns (except from Ross's Gull) by their cuneiform tails. From both these genera the shape of the bill and the position of the nostrils are still more distinctive. The upper mandible is vaulted like that of the Plovers, nearly straight for two thirds of its length, but ends in a strongly curved raptorial hook; the nostrils are partially covered by a horny shield, which leaves the entrance to them diagonal. The bills of the Skuas, as well as their cuneiform tails, bear a superficial resemblance to those of the Petrels, but these two groups are said to be otherwise widely separated.

Only six species of Skua are known, four of which breed in the Arctic Region, one of the four being represented by two nearly allied species in the southern hemisphere, breeding on the confines of the Antarctic Region. The four northern species are all included in the British list, two of them breeding within our confines, and the other two visiting our shores on migration.

The Skuas resemble the Gulls in many of their habits, but they are more bold and predacious birds, obtaining much of their food by robbing the Gulls and Terns of their hard-earned spoils, or even preying on birds, small mammals, and eggs; they also eat insects, crustaceans, &c. In their flight, mode of progression on land and sea, in their notes, nests, and eggs, and the places they frequent, they do not differ in any very important respect from the birds in the preceding genus.

STERCORARIUS CATARRHACTES.

GREAT SKUA.

(Plate 55.)

Larus fuscus, *Briss. Orn.* vi. p. 165 (1760).
Larus catarractes, *Linn. Syst. Nat.* i. p. 226 (1766); **et auctorum plurimorum—** (*Temminck*), (*Naumann*), (*Dresser*), (*Saunders*), &c.
Larus keeask, *Lath. Ind. Orn.* ii. p. 818 (1790).
Cataracta skua, *Brünn., Retz. Faun. Suec.* p. 161 (1800, *nec Briss.*).
Lestris catharractes (*Linn.*), *Illiger, Prodr.* p. 273 (1811).
Catarracta fusca (*Briss.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 40 (1816).
Stercorarius catarrhactes (*Linn.*), *Vieill. N. Dict. d'Hist. Nat.* xxxii. p. 154 (1819).
Cataractes vulgaris, *Flem. Brit. An.* p. 137 (1828).
Stercorarius pomarinus, *Vieill. Gal. des Ois.* p. 220 (1834).
Megalestris catarrhactes (*Linn.*), *Bonap. Cat. Parzud.* p. 11 (1856).
Buphagus skua (*Brünn.*), *Coues, Proc. Acad. Nat. Sc. Philad.* 1863, p. 125.
Megalestris skua (*Brünn.*), *Ridgw. Nom. N. Amer. Birds*, p. 53 (1881).

The only locality in the British Islands where the Great Skua is known to breed is in the Shetlands, and even there incessant persecution has driven it from all its old stations, with the exception of one on Unst and a second on the neighbouring island of Foula. It appears never to have bred in the Orkneys, and to the rest of the United Kingdom it is only an accidental straggler in autumn and winter. It occurs more or less frequently along the entire east and south coasts of England and Scotland, but in the west it is much rarer, and it is seldom observed in Ireland. It is sometimes driven inland by stormy weather.

The Great Skua is an oceanic bird, and is only known to breed in Iceland, the Faroes, and on the Shetlands, though it probably also breeds in Arctic America. It occasionally visits the coasts of Norway, but there is no satisfactory evidence of its breeding there. In winter it sometimes strays as far as the coasts of Spain and Morocco, but is not known to enter the Mediterranean. It is an accidental visitor to Greenland, and occasionally visits the Atlantic coasts of North America. It is said to occur in the Arctic regions of America, and is recorded as far west as the mouth of the Mackenzie River, whilst a solitary example has been obtained in California.

On both coasts of South America south of the tropics a nearly allied form, *Stercorarius chilensis*, occurs, having a somewhat weaker bill, and with the underparts and axillaries bright chestnut instead of brown. A third form, *S. antarcticus*, inhabits the southern seas south of the tropics, and is, to quote Saunders, "distinguished by its stout deep bill, with its

well-marked angle at the gonys, larger and coarser feet, and by its nearly uniform sooty-brown plumage, the axillary plumes being invariably smoke-coloured."

The Great Skua lives almost entirely on the ocean and on the rocky coasts of oceanic islands, where it leads a solitary life, like a bird of prey, avoided by the smaller sea-birds, who know full well that it is an enemy who is ever ready to pounce upon them if wounded, or to follow them until they disgorge their newly swallowed meal, to assist the rapidity of their flight, or delay the progress of their pursuer. As the breeding-season approaches it is generally seen in pairs, and towards the end of April it assembles in small colonies at its breeding-stations; but even there the nests are seldom placed very near each other. Early or late in May, according to the season, eggs are laid, but before the end of August the young are well able to fly, the colony is dispersed, and the breeding-grounds are deserted. The Great Skua is a bird of very powerful flight, sailing majestically through the air like a large Gull, but, if necessary, able to twist and turn with great ease. It is at once wary and bold—too wary to allow itself easily to be approached within gunshot, except at its breeding-grounds, where its boldness is very remarkable. It dashes up in great excitement within a few feet of the intruder, then, perhaps, skims over his head with outstretched feet and loud whirr of wing, sometimes even striking him in its rage. Time after time it returns to the attack, swooping down from above, or skimming over the surface of the ground to rise at the object of its pursuit. It easily succeeds in frightening away the Ravens and the Sea-Eagles, and very few dogs will face its furious attacks.

It makes a somewhat slight nest, treading a hollow in the moss nearly a foot in diameter, and lining it with bits of moss, a little dead grass, and a feather or two. The usual number of eggs is two, but in some instances it is said that one only is found. The statement that it sometimes lays three eggs does not seem to be well authenticated. The eggs vary in length from 3·0 to 2·7 inch and in breadth from 2·0 to 1·9 inch. They vary in ground-colour from pale buffish brown to dark buffish brown; the overlying spots are dark brown, and the underlying ones are greyish brown, generally most thickly distributed round the large end, where they are sometimes confluent, and usually varying from the size of a pea downwards, and never very conspicuous. They bear a close resemblance to brown varieties of the eggs of the Lesser Black-backed and Herring-Gulls, but the spots always appear duller, in consequence of the less difference in colour between the markings and the ground-colour.

The ordinary call-note of the Great Skua on the wing is an *ag, ag*, like that of the larger Gulls; but when chasing birds to make them disgorge their food it utters a loud sharp cry, which is supposed to resemble the syllable *skua* with a strong terminal accent, whence its name. At the nest

the note is shorter, like the suppressed bark of a dog. All these notes seem to be modifications of the same unmusical sound.

No kind of fish or flesh comes amiss to the Great Skua, nor is it particular as to the mode in which it is acquired. It snatches up fish as they swim too near the surface of the water, or picks them up as they lie dead and stranded on the shore. It is very fond of following the fishing-boats to secure any refuse that may be thrown overboard, and delights to chase a little Gull or Tern that has just caught a fish, and generally succeeds in robbing it of its prey. It makes raids into the breeding-colonies of its smaller neighbours, and, in spite of their loud cries, plunders their nests of eggs or young. Wounded Gulls often fall victims to its voracity; and Major Feilden found the castings, which in many places covered the little hillocks near their nesting-colony on one of the Faroes, composed principally of the bones and feathers of Kittiwakes.

It is a rather remarkable fact that so fierce and predacious a bird should be easily tamed; but there does not seem to be much doubt that this is the case. Edmonston informed Macgillivray that in captivity it is gentle and affectionate, and will feed on almost anything.

The Great Skua may always be recognized by its large size, long feet, and only slightly prolonged central tail-feathers. The wing varies in length from 17 to 15½ inches, none of the other species exceeding 14 inches. The tarsus varies in length from 2¾ to 3¼ inches, and is shorter than the middle toe and claw. The tail is only slightly rounded, the central feathers not projecting more than an inch beyond the outer ones.

Of the four species of British Skuas two of them, the Pomarine Skua and Richardson's Skua, have a light and a dark phase. The Great Skua has only a dark phase, whilst Buffon's Skua has only a light phase*. There is no difference in colour or size between the sexes of the Great Skua. The general colour of the upper parts is dark brown streaked with reddish brown; the quills and tail-feathers are uniform dark brown, shading into white on the base, which on the wing forms a white patch beyond the primary coverts, but on the tail-feathers is entirely concealed by the coverts. The underparts are a slightly paler brown, obscurely streaked with darker brown on the breast and flanks. Bill black; legs and feet slaty black; irides hazel. British ornithologists appear to be unacquainted with the changes of plumage which this species undergoes; but Naumann states that the young in first plumage and very old birds are more uniform in colour. Dresser and Saunders apparently regard the uniform plumage as a melanistic phase. Young in down are brownish grey, slightly darker on the upper parts.

* The two phases of plumage of the Skuas have no connection with the age of the bird, and are discernible in the young in first plumage as well as in the adult.

STERCORARIUS POMARINUS*.

POMARINE SKUA.

(Plate 55.)

Stercorarius striatus, *Briss. Orn.* vi. p. 152, pl. 13. fig. 2 (1760, juv.).
Lestris pomarinus, *Temm. Man. d'Orn.* p. 514 (1815); **et auctorum plurimorum**
—*Naumann*, (*Audubon*), (*Baird, Brewer & Ridgway*), *Bonaparte*, &c.
Stercorarius pomarinus (*Temm.*), *Vieill. N. Dict. d'Hist. Nat.* xxxii. p. 158 (1819).
Cataractes pomarina (*Temm.*), *Steph. Shaw's Gen. Zool.* xiii. pt. 1, p. 216 (1826).
Lestris striatus (*Briss.*), *Eyton, Hist. Rar. Brit. B.* p. 53 (1836).
Coprotheres pomarinus (*Temm.*), *Reich. Nat. Syst. Vög.* p. v (1852).
Lestris pomarhina (*Temm.*), *Preyer, Reise Island*, p. 417 (1862).
Lestris pomatorhinus (*Temm.*), *Sclater, Ibis*, 1862, p. 297.
Stercorarius pomatorhinus (*Temm.*), *Newton, Baring-Gould's Iceland*, p. 418 (1863).

The Pomarine Skua appears to have been first discovered by Pallas, who remarked that in the Buffon's Skuas from Kamtschatka the two centre tail-feathers were not pointed, and asked the question whether this difference ought to be regarded as specific. In 1810 Meyer (Taschenbuch, ii. p. 490) described and figured a Pomarine Skua under the name of *Larus parasiticus*, Linn.; but it was not until 1815 that Temminck proved its distinctness from Buffon's Skua, and gave it the name it now bears.

The first example of the Pomarine Skua known to have been obtained in the British Islands is one now in the British Museum, said to have been killed at Brighton and purchased in 1819 at the sale of the celebrated Bullock collection. Another example, said to have been killed near Dover, was sold at the same time. Since that date the Pomarine Skua has been found to be a more or less common winter visitor to our islands, having been obtained on most parts of the coasts of Scotland and England, but more abundantly, as is usually the case, in the east than in the west. It sometimes occurs in large numbers, as, for instance, in the autumn of 1879, when thousands were seen off the Yorkshire coast, and in the autumn of 1880, when smaller flights were observed. In Ireland it is much less

* Preyer's suggestion that Temminck's name was derived from πῶμα (an operculum) and ῥινός (of the nostril) is very ingenious, but has not a shadow of evidence to support it. The Pomarine Skua does not differ from the other Skuas in the structure of its nostrils, but is remarkable as being by far the most marine of these very marine birds; and probably Temminck adopted the name under the impression that it was a legitimate contraction of "permarinus;" but, right or wrong, his name ought to stand as it is.

common, and is only known as an irregular visitor. It is sometimes driven inland by storms.

The Pomarine Skua is a circumpolar bird, breeding beyond the Arctic circle on the shores and tundras of both hemispheres. It is not known to breed anywhere on continental Europe, but in Asia its nest has been taken on the Yalmal and Taimur peninsulas and in the extreme north-east of Siberia, and it probably breeds on Nova Zembla and Spitzbergen. It occasionally visits the Faroes and Iceland, has been met with in Greenland, and probably breeds throughout Arctic America. In winter it occasionally visits the Baltic, the German Ocean, the Mediterranean, and the west coast of Africa, where it has occurred almost as far south as the Cape. In Asia it has been procured in winter once in Japan, once on the coast of Tenasserim, and once off the coast of North Australia. On the Pacific coast of America it has occurred off the coast of Peru; on the Atlantic side it has occasionally been found as far south as New York, and it has also occurred in Pennsylvania and the Mexican lakes. It has no near ally.

The Pomarine Skua is even more oceanic in its habits than the Great Skua; it breeds further north, and wanders further south in winter. So reluctant does it seem to come inshore, even to rest, that it is not an uncommon thing to find birds far out at sea, drifting almost helpless on the waves, tired out with battling against the storm.

All the Skuas resemble each other very closely in their habits; and in the nature of its food and its mode of acquiring it the Pomarine Skua does not differ from its congeners. Its notes are described as very similar, and it has the same rapid flight, with the almost Swallow-like facility of making sudden turns. It can swim with the same ease, and is equally incapable of plunging like a Tern or diving like a Guillemot.

The Pomarine Skua is a much more arctic bird than Richardson's Skua, or even than the Great Skua, but is not quite so much so as Buffon's Skua, which is the Arctic Skua *par excellence*. On the other hand, it does not appear to range as far inland as Buffon's Skua. When Harvie-Brown and I were in the valley of the Petchora, we saw abundance of both Buffon's and Richardson's Skuas between lat. 68° and 69°, but only the latter species was breeding so far south. It was only when we had sailed out of the delta of the Petchora into the sea between Nova Zembla and Kolguiev (between lat. 69° and 70°) that the Pomarine Skua appeared. Middendorff found all three species breeding on the Taimur peninsula; but Buffon's Skua was the only one which he saw north of lat. 74½°.

Middendorff found the Pomarine Skua breeding in very great numbers near the Taimur lake in lat. 74°. It arrived on the 18th of June, but it was not until the 19th of July that he found eggs. No nest was made beyond a depression in the moss on the tundra. The number of eggs seems

to be never more than two, but on the Yalmal peninsula Finsch never found more than one nestling with the parents. The eggs vary in ground-colour from dark russet-olive to pale olive; the surface-spots are often blurred, generally most abundant round the large end, where they are sometimes confluent, and are very irregular in shape, varying in size from that of a large pea downwards, and are of a dull reddish brown in colour; the underlying spots are dull greyish brown. They vary in length from 2·4 to 2·25 inch, and in breadth from 1·7 to 1·6 inch. They are indistinguishable from certain varieties of the eggs of Richardson's Skua and the Common Gull.

The Pomarine Skua, like Buffon's and Richardson's Skuas, is a more gregarious bird, especially in winter, than the Great Skua. Booth, in his 'Rough Notes,' gives some very interesting particulars of the large flocks, numbering hundreds and even thousands, of Pomarine Skuas which linger at a distance of forty or fifty miles from the coast of Norfolk and Suffolk during their migration southwards. In October and November they may be seen together with large flocks of Gulls, Gannets, and Divers, the great attraction being the fish rejected by the herring-fishers when hauling in their nets and cleaning and sorting the fish. Even on these occasions they cannot be satisfied with their own share of the plunder, but must needs rob the smaller Gulls. In stormy weather great numbers are driven ashore in an almost helpless and half-starved condition; but they generally meet with a very inhospitable reception from the Hooded Crows, who, though for the most part aliens from Scandinavia, are evidently of opinion that they have a vested interest in the flotsam and jetsam of the British shores.

Mr. Nelson has sent me a detailed account of the extraordinary number of Pomarine Skuas which visited the Yorkshire coast in the autumn of 1879. Flocks began to arrive at Redcar on the 6th of October, and hundreds flew past between that date and the 14th, when a heavy storm came on, which brought the Skuas to the coast in thousands. They were remarkably tame, and great numbers were shot ('Zoologist,' 1880, p. 18). Mr. Lloyd Patterson informs me that this unusual migration of Pomarine Skuas extended to the north of Ireland, many birds being seen and several shot between the 13th and 22nd of October in that year.

The Pomarine Skua is intermediate in size between the Great Skua and Richardson's Skua, the wing varying in length from 13½ to 14 inches. The tarsus measures about 2 inches, and is longer than the middle toe and claw. Its smaller size and shorter foot will always distinguish it from the Great Skua, whilst its broad and rounded (and in adults twisted) central tail-feathers prevent its being confused with Buffon's or Richardson's Skuas, in which the central tail-feathers are narrow and pointed.

There is no difference in colour or size between the sexes of the Poma-

rine Skua. The adult has the general colour of the upper parts dark brown. The colour of the underparts varies in a somewhat exceptional manner. There are two forms of this species: in one the entire underparts are as dark a brown as the upper parts; in the other the underparts are white barred on the sides of the breast, the flanks, and the under tail-coverts with dark brown; the white on the throat extends to the sides of the neck, meeting below the nape, and is more or less suffused with yellow. Bill slate-grey, black at the tip; legs and feet black; irides hazel. Young in first plumage of the light form have the upper parts dark brown, each feather with a narrow pale buffish-brown margin, and the underparts a paler brown, each feather with a broad pale buffish-brown margin. Young in first plumage of the dark form have both the upper and under parts dark brown, each feather with an obscure pale margin, most conspicuous on the under tail-coverts. In both forms each successive autumn moult advances the colours of the plumage to that of the adult, which, in Booth's opinion, is not assumed until the fifth moult. Young in down are uniform sooty brown, slightly paler on the underparts.

STERCORARIUS RICHARDSONI.

RICHARDSON'S SKUA.

(Plate 55.)

Stercorarius stercorarius, *Briss. Orn.* vi. p. 150 (1760).
Larus parasiticus, *Linn. Syst. Nat.* i. p. 226 (1766, *partim*).
Larus crepidatus, *Banks, Hawkesworth's Voy.* ii. p. 15 (1773).
Lestris crepidatus (*Banks*), *Illiger, Prodr.* p. 273 (1811).
Catarracta cepphus, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 39 (1816).
Stercorarius crepidatus (*Banks*), *Vieill. N. Dict. d'Hist. Nat.* xxxii. p. 155 (1819).
Stercorarius cepphus (*Leach*), *Swains. Faun. Bor.-Amer.* p. 432 (1831).
Lestris richardsoni, *Swains. Faun. Bor.-Amer.* p. 433, pl. 73 (1831); **et auctorum plurimorum**—*Macgillivray, Audubon, Gould, Meyer, Coues, Nuttall, Bonaparte, Eyton, Temminck, Schinz, Thompson, Sclater*, &c.
Cataractes richardsoni (*Swains.*), *Macgill. Man. Brit. B.* ii. p. 257 (1842).
Lestris spinicaudus, *Hardy, Rev. et Mag. Zool.* p. 657 (1854).
Lestris hardyi, *Bonap. Consp.* ii. p. 210 (1857).
Lestris thuliaca, *Preyer, Reise Island*, p. 418 (1862).
Stercorarius richardsoni (*Swains.*), *Coues, Proc. Acad. Nat. Sc. Philad.* 1863, p. 135.
Stercorarius tephras, *Malmgren, Journ. Orn.* 1865, p. 392.
Stercorarius spinicauda (*Hardy*), *Layard, B. S. Afr.* p. 366 (1867).
Stercorarius asiaticus, *Hume, Stray Feath.* p. 269 (1873).
Stercorarius parasiticus (*Linn.*), *apud* (*Tunstall*), (*Boddaert*), (*Latham*), *Schaeffer*, (*F. Faber*), (*Brehm*), (*Naumann*), (*Fleming*), (*Selby*), (*Keyserling & Blasius*), *De Selys-Longchamps, Gray*, (*Middendorff*), (*Bonaparte*), *Lawrence, Blakiston, Degland & Gerbe, Coues, Newton, Andersson, Gould, Hume*, (*Heuglin*), *Dall & Bannister, Buller, Sharpe, Baird, Brewer & Ridgway*, &c. Nec (*Gmelin*), (*Phipps*), (*Scoresby*), (*O. Faber*), (*Pallas*), (*Illiger*), *Swainson & Richardson*, (*Macgillivray*), (*Temminck*), (*Jenyns*), (*Gould*), (*Audubon*), (*Meyer*), &c.

Richardson's Skua is by far the most common species of the genus which visits the British Islands, but its only known breeding-places are on the Outer Hebrides, principally North and South Uist, and on the Orkney and Shetland Islands; Booth found it breeding on the moors in Caithness, and it is said to breed regularly in Sutherlandshire. On migration it is found more or less frequently on all parts of the Scotch coast. In England it is best known and most numerous on the east coast, passing regularly on passage, but becomes rarer on the south and west coasts. It has been said to breed near Achil Island in Ireland; but the evidence is not satisfactory, and it is only known with certainty as a regular visitor on migration to the coasts of that country. It is said to be more abundant in spring than in autumn; a few non-breeding birds often frequent the English coasts during the summer, and a few remain during the winter. It is sometimes driven inland by bad weather.

Richardson's Skua is a circumpolar bird, breeding in the arctic and sub-

arctic regions of both hemispheres, including the Faroe Islands, Iceland, Spitzbergen, and Nova Zembla. In winter it wanders down the west European and African coasts as far as the Cape of Good Hope, but does not migrate far into the Mediterranean. It has occurred on migration in the valley of the Volga, and winters on the Mekran coast and the west coast of India as far south as Bombay. Snow obtained it near the Kurile Islands; but it has hitherto escaped detection on the Japanese and Chinese coasts, though it has occurred several times in New Zealand. On the Atlantic coast of America it ranges in winter to New Brunswick and the coasts of the United States, and has probably occurred as far south as Rio de Janeiro. It has no nearer ally than Buffon's Skua.

Richardson's Skua has inappropriately been called the Arctic Skua by Pennant, Montagu, Bewick, Selby, Saunders, and others; but as this name has often been most appropriately applied to Buffon's Skua, and as Richardson's Skua is the least Arctic of all the Skuas, it is absurd to perpetuate the misnomer. In its habits it differs very little from Buffon's Skua. Its flight is very strong and powerful and much resembles that of a Hawk. It can turn and double with wonderful facility, and when indulging in its usual practice of chasing a Gull or a Tern until it drops the fish it has just secured, its poor victim seems to have no chance of escape, and is headed by the Skua with the greatest ease. It is not content with robbing other birds of their hard-earned food, but it seldom loses a favourable opportunity of preying upon their eggs or young. It is also one of the scavengers of the coast, and picks up the numerous stranded animals thrown up by the tide as well as floating on the water. At its breeding-grounds it also eats insects and fruit. In winter it is rarely seen inland, and often goes far out to sea, especially to attend the fishing-boats.

Richardson's Skua is a somewhat late breeder, and passes northwards on migration along our shores during April on its way to its nesting-grounds, which it reaches early in May. Even in Scotland its eggs are seldom laid before the end of that month, whilst in the valley of the Petchora we did not obtain eggs until the second week in June. Although Richardson's Skua is a very gregarious bird and mixes freely with flocks of Buffon's Skuas, it can scarcely be said to breed in colonies. The eggs are scattered far and wide over the moors, and are very difficult to find except by the somewhat tedious process of watching the female to the nest. The vicinity of a nest is generally discovered by the anxiety of the female, who careers wildly about and occasionally swoops down within a few inches of the observer's head. By lying quietly on the grass her alarm disappears; she alights on the ground and after changing her position several times, generally ends by settling down on her eggs. Like Buffon's Skua this species may often be seen perched motionless on a hillock on the tundra, where it remains for a quarter of an hour or more. At other times it is

very active, and in the Varanger fjord I have seen them sailing round and round at all hours. The nest is placed on the wide open moor with no cover of any kind, and is a mere depression in the ground scantily lined with a little dry grass and occasionally a few dead leaves. Two is the normal number of eggs, but sometimes birds have been found sitting on a solitary egg, and in rare instances three eggs have been found in the same nest. Few eggs vary more in shape than those of Richardson's Skua, some being very long and pointed, others almost round. They vary in ground-colour from russet-brown to pale olive; the overlying spots are dark brown, sometimes almost black, generally evenly though somewhat sparingly distributed over the entire surface, but occasionally most of them are collected in a ring round the larger end, where they are sometimes confluent; the shape of the spots is very fantastic, many of them are prolonged into streaks, and they vary in size from that of a large pea downwards; the underlying spots are few, very inconspicuous, and pale greyish brown in colour. The eggs vary in length from 2·55 to 2·0 inch, and in breadth from 1·7 to 1·55 inch. It is almost impossible to give any character by which the eggs of this bird may be distinguished from certain varieties of those of the Common Gull, Black-headed Gull, and Pomarine Skua.

The note of Richardson's Skua at the nest resembles the syllables *kyow*; but as it screams whilst pursuing the small Gulls and the Terns it may be likened to the sound of *yah, yah*.

Dark forms of this species may be found paired with light forms; but the progeny, when adult, always resemble one of their parents in colour, though immature examples are sometimes mistaken for intermediate forms.

Richardson's Skua and Buffon's Skua may be distinguished from the Great Skua and the Pomarine Skua by their smaller size and narrow pointed central tail-feathers, but they appear to intergrade with each other so closely that some ornithologists doubt whether they are more than subspecifically distinct*. Richardson's Skua varies in length of wing from

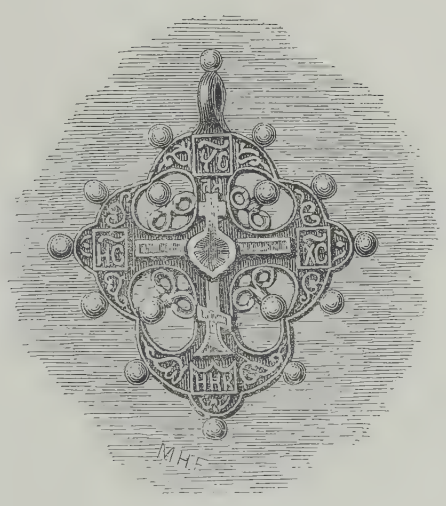
* Howard Saunders, who is supposed to have studied the Gulls, Terns, and Skuas more than any other ornithologist, and has promised us a monograph of the Laridæ when his studies are more advanced, writes, in the fourth edition of 'Yarrell's British Birds,' iii. p. 684, "An unfailing distinction at all ages is to be found in the colour of the shafts of the primaries;" and then he proceeds to explain that in Richardson's Skua they are all white, whilst in Buffon's Skua only the shafts of the two outer ones in each wing are white, the others having dusky shafts. Baird, Brewer, and Ridgway deny the validity of this character, and assert that in the number of primaries having white shafts the two species completely intergrade; but Saunders admits that the passage on page 678 of the work referred to, in which he describes the colour of the shafts of the primaries of Richardson's Skua as white only on the first and second, is an error. Dr. Stejneger has, however, pointed out that the position of the nostrils varies in the two species. In Buffon's Skua they are said to be nearer the frontal feathers than the tip of the bill, whilst in Richardson's Skua the contrary is said to be the case.

11¾ to 13¼ inches. The tarsus never reaches 2 inches in length, but is always longer then the middle toe and claw. The middle tail-feathers of adult birds are three or four inches longer than the outer ones. A further distinction between the two species is to be found in the colour of the tarsus, that of Richardson's Skua being black and that of Buffon's Skua slate-grey.

It is not known that there is any difference in the colour of the sexes of Richardson's Skua, but the female has the two elongated tail-feathers somewhat shorter than the male. As in the Pomarine Skua, this species has a light and a dark form, which are, to a considerable extent, connected with geographical distribution, the light form being the predominant one north of the Arctic circle, and the dark one being most abundant in birds breeding south of the Arctic circle. Under these circumstances it would be more consistent to regard the two forms as subspecifically distinct; but the uncertainty attaching to any explanation of the plumages of this Skua which has hitherto been attempted makes it, perhaps, premature to recognize the distinctness of the two forms in their nomenclature. So far as I am able to judge, the facts appear to be as follows:—In the adult of the dark form the whole of the plumage is an almost uniform dark sooty brown, slightly suffused with slate-grey on the upper parts, and with a bronzy yellow on the ear-coverts and sides of the neck. After the autumn moult the colour of the plumage is rich and dark, but in the course of the summer it fades into a paler and redder brown. In the adult of the light form the slate-grey of the upper parts is a little more pronounced than in the dark form; the general colour of the underparts is white, shaded with brown on the sides of the breast, the vent, and under tail-coverts; the white on the throat extends round the sides of the neck and across the lower ear-coverts almost to the nape, and is suffused with yellow. Bill slate-grey, black at the tip; legs and feet black; irides hazel. Young in first plumage are uniform sooty brown, every feather having a buff margin, very conspicuous on the wing-coverts and primaries, almost obsolete on the tail-feathers. It is not known whether there is any difference between the two forms in first plumage, but in the intermediate stages the greater amount of white on the underparts of the light form is very conspicuous. The adult plumage is probably not completely assumed until after the fifth autumn moult. Young in down are uniform sooty brown, slightly paler on the underparts.

The light and the dark form habitually pair together; and Booth, who observed both forms during the breeding-season in the north of Scotland, states that in the majority of instances a light bird was paired with a dark one. Saunders and Hancock are of opinion that the result of this cross-breeding is a form intermediate between the two; but the evidence appears to me to point exactly in the contrary direction.

It seems to me that these ornithologists have mistaken immature birds for intermediate forms. Booth's observations appear to prove that intermediate forms are not found at the breeding-grounds. If cross-breeding be the rule, as he asserts, a few generations would amalgamate the two forms; and if the theory of Saunders and Hancock were correct, only intermediate forms should be found at the breeding-grounds. Richardson's Skua appears to me to be, like the Pomarine Skua, a dimorphic species, and the progeny of a light and dark bird appear, when adult, to resemble one of their parents.



STERCORARIUS BUFFONI.

BUFFON'S SKUA.

(Plate 55.)

Stercorarius longicaudus, *Briss. Orn.* vi. p. 155 (1760); *Vieill. N. Dict. d'Hist. Nat.* xxxii. p. 157 (1819).
Larus parasiticus, *Linn. Syst. Nat.* i. p. 226 (1766, *partim*).
Catharacta parasitica (*Linn.*), *Faber, Faun. Grœnl.* p. 103 (1780).
Lestris parasiticus (*Linn.*), *Illiger, Prodr.* p. 273 (1811).
Lestris buffoni, *Boie, Isis*, 1822, pp. 562, 874; et auctorum plurimorum—*Bonaparte, Kaup, Lesson, Schinz, Schlegel, Middendorff*, (*Lawrence*), (*Dall & Bannister*), (*Coues*), (*Irby*), &c.
Lestris lessoni, *Degl. Mém. Ac. R. Lille*, p. 108 (1838).
Stercorarius longicaudatus, *De Selys-Longch. Faun. Belg.* p. 156 (1842).
Lestris longicaudatus (*De Selys-Longch.*), *Thomp. Birds Ireland*, iii. p. 399 (1851).
Stercorarius buffoni (*Boie*), *Coues, Proc. Acad. Nat. Sc. Philad.* 1863, p. 136.
Lestris brissoni, *Boie, fide Degl. & Gerbe, Orn. Eur.* ii. p. 400 (1867).
Stercorarius parasiticus (*Linn.*), *Saunders, Proc. Zool. Soc.* 1876, p. 330.

Buffon's Skua is a somewhat rare visitor on migration to the British Islands. It occurs most frequently as an accidental straggler to the coasts of Scotland and the east coast of England, as far south as Yorkshire. South of this limit its occurrence is even more accidental; whilst the west coast of England is rarely visited at all. In Ireland it has been obtained on migration, principally on the north and east coasts. It is sometimes driven inland by storms. The statements that this bird has bred in the Hebrides, in Caithness, and in the Orkneys are founded upon very meagre and entirely insufficient evidence.

The range of Buffon's Skua is, during the breeding-season, more northerly than that of Richardson's Skua, and is confined to the Arctic regions of both hemispheres. The only locality where it is known to breed south of lat. 68° is above the limit of forest-growth, on the Dovrefjeld, in lat. 62½°. It is not known to cross the continent on migration, but appears to follow the coast-line as far south as Gibraltar, wandering in the Mediterranean as far east as Italy. It has not been observed in the Pacific Ocean south of Alaska, except on the Pribylov and Kurile Islands, but on the Atlantic coast of America it has been known to occur as far south as New York. It has no nearer ally than Richardson's Skua.

Buffon's Skua is more arctic in its habits than the so-called Arctic or Richardson's Skua. The tundra, which normally looks like an English flower-garden run wild, gay with many-coloured blossoms, luxuriant with

rich and rank foliage, must have altered its character before the breeding-grounds of Buffon's Skua are reached. The stunted willows may be almost all gone, and the creeping birches far and far between, like unhealthy ivy-plants trailing on the ground, with nothing up which they can climb; the gay flowers may have given place to almost as gay mosses and lichens, and of the rich foliage little may be left beyond dwarfed cranberries and crowberries; but the country must look barren before the nests of Buffon's Skua are reached. Above lat. 72° in Siberia, or in a similar climate high up on the Scandinavian fells, is the home of Buffon's Skua, where the oases of moss and lichens are scattered in patches over the black peat or equally barren yellow clay. They are described by Middendorff as arriving at their breeding-grounds on the Taimur peninsula on the 17th of June. Eggs were laid on the 4th of July, and on the 27th young in down appeared. On the 16th of September they were still at their breeding-grounds, and one was seen as late as the 3rd of October.

Buffon's Skua breeds in colonies, but the nests are scattered over a considerable area. It seems to be a very gregarious bird. When Harvie-Brown and I were in the valley of the Petchora, we saw nothing of this bird on migration. Probably it had followed the coast-line, for when we reached the delta we found it had arrived. We were apparently some distance south of its breeding-grounds, but we often met with small parties of five or six, all adult birds. On the tundra it was most often seen in pairs, and we often remarked its habit of occasionally remaining for a long time in one spot on the ground, probably digesting its food. In the stomachs of those we shot we found the remains of beetles and cranberries; but it does not confine itself to this food even in the breeding-season. On the muddy margin of an inland sea connected with the lagoons of the Petchora I shot with one barrel a young Dunlin and broke the wing of an old bird, whilst with the second barrel I killed a Little Stint. The cartridge-extractor of my gun was out of order, and it took me some time to reload. The wounded Dunlin ran a few yards when a couple of Buffon's Skuas came up, quarrelled almost under my nose for the wounded bird, and carried it off before I could struggle through the mud to the rescue. On the 3rd of July we met with a large flock of Buffon's Skuas: we were strolling over a piece of marshy ground near the Petchora, when we caught sight of a large flock of these birds in the distance. Just at that moment a pair of Grey Plovers rose, and Harvie-Brown stopped to watch them whilst I marched after the Skuas, which had all alighted on the ground, not far from a small flock of perhaps a score Siberian Herring-Gulls. Before I had got within a hundred yards of them, the Gulls rose and flew towards me, followed soon afterwards by the Skuas. I let the Gulls go by, and took the nearest Skua as soon as he came within range. Fortunately

he fell, and was at once surrounded by about a hundred or a hundred and fifty Buffon's Skuas, flying in all directions, generally about ten within shot. This continued for about half an hour, during which Harvie-Brown came up, and between us we bagged a dozen birds, one of which proved to be a Richardson's Skua. They were very noisy birds, continually making a cry like *yak, yak,* as they flew towards us. They screamed wildly as they flocked together and left us; but as soon as our backs were turned we saw them flying back to the same place. Buffon's Skua looks like a great black Tern on the wing, often hovering in the air like a Kestrel, and in other ways is very Tern-like in its habits. Six days afterwards we visited the same spot; the large flock of Buffon's Skuas had returned, some were on the moor, and many were swimming on the river.

Buffon's Skua feeds on fish, crustaceans, and mollusks, in addition to the insects, fruit, lemmings, or small birds which form its principal food during the breeding-season. On the ocean, this bird is as great a robber as its congeners, numbers of them following the flocks of Kittiwakes, swooping down upon them like Hawks, and compelling them to disgorge some of their recently caught fish.

Its nest is a slight depression in the grass or moss, lined sparingly with a little dry grass. The number of eggs is almost invariably two; but in very rare instances one only, or as many as three are reported to have been found. They are precisely similar in colour to those of Richardson's Skua, and are subject to the same variations, but on an average they are slightly smaller in size. They vary in length from 2·2 to 1·9 inch, and in breadth from 1·6 to 1·4 inch.

Macfarlane, who found it breeding in some numbers near the shores of the Arctic Ocean, not far from the Mackenzie River, remarked that the female sometimes feigned lameness when flushed from the nest, and that both parents attacked an intruder with great boldness and pertinacity.

Buffon's Skua may easily be distinguished from the Great Skua and the Pomarine Skua by its narrow pointed central tail-feathers, which exceed the lateral feathers in length by four to eight inches. Compared with Richardson's Skua, it is, on an average, a smaller bird with longer central tail-feathers and fewer primaries with white shafts (seldom more than the first and second). In all these points the two supposed species are said to intergrade; but it is asserted that a constant character is to be found in the positions of the nostrils, which in Buffon's Skua are said to be placed nearer the frontal feathers than the point of the bill.

It is not known that there is any difference in the colour of the sexes of Buffon's Skua; but females are said to have slightly shorter centre tail-feathers than males. The adult Buffon's Skua very closely resembles the light form of Richardson's Skua, but it is not known to have a dark

form resembling that of the allied species *. In the adult in newly-moulted plumage the general colour of the upper parts is greyish brown, almost black on the head, wings, and tail-feathers; the general colour of the underparts is white, shading into brown on the flanks and under tail-coverts; the white on the throat extends to the sides of the neck and across the lower ear-coverts to the nape, and is suffused with yellow. Bill slate-grey, black at the tip; legs and feet slate-grey, with irregular black patches; irides hazel. Young in first plumage are uniform sooty brown, the flank-feathers and the upper and under tail-coverts having buff margins. Buffon's Skua is probably several years before it attains its adult plumage, the white on the underparts gradually increasing from year to year. Young in down are sooty brown, slightly paler on the underparts.

* Dresser, in his 'Birds of Europe,' says that Middendorff "mentions that Buffon's Skua was subject to as much and similar variations as the Pomarine Skua on the underparts of the body." This statement is not true, and is no doubt founded on a mistranslation of a passage where Middendorff says that exactly the same variation in the colour of the belly occurred in Richardson's Skua as in the Pomarine Skua, and under the same circumstances. These circumstances are explained to be that the white-bellied birds had longer centre tail-feathers than the dark-bellied.

Family ALCIDÆ, or AUKS.

The Auks form a small but well-defined family, probably nearest related to the Divers. When the study of birds has sufficiently progressed to make the grouping of Families into Orders a possibility, it is not improbable that the Auks, the Divers, and the Plovers may find themselves grouped round the more highly developed Gulls and Petrels. Forbes associated them with the Gulls and Plovers; Sclater places them in an order with the Grebes and Divers; and Gadow places them between the Gulls and Divers. In the arrangement of the bones of the palate the Auks are schizognathous, and were placed by Huxley in a family which he called Cecomorphæ, and which contained also the Gulls, the Petrels, and the Divers. In their pterylosis the Auks resemble the Divers, the Grebes, and the Penguins, though having well-marked characters of their own. There are two notches on each side of the posterior margin of the sternum in the Auks, but the inner pair are often closed at the entrance.

The Auks moult completely in September, and change their small feathers in March from winter to summer plumage. The young are born covered with down, and can swim almost at once. The first plumage is assumed in a month or more, and is moulted in the first spring into a plumage very closely resembling that of the adult.

The Auks have no hind toe; the feet are webbed and placed very far back; the tarsus is very short and covered with small hexagonal scales, which are generally enlarged in front into broad scutellæ; but in some species the scutellation is very incomplete. The wings and tail are short, and the bill is very variable in shape.

This family is a very small one and only contains about a score species. It may be regarded as circumpolar; but many of the species are confined to the Pacific coasts of the Arctic regions.

Genus FRATERCULA.

The Puffins were included by Linnæus in the genus *Alca*; but in 1760 Brisson, in his 'Ornithologia,' vi. p. 80, provided the genus *Fratercula* for their reception. The Common Puffin, *F. arctica* (being the *Fratercula fratercula* of Brisson), is the type.

The Puffins may at once be distinguished from the Auks by the facts that the feathers at the base of the bill do not extend as far as the nostrils, and that the bill is provided with one or more sheath-like structures of an orange-red colour, which appear in spring and are shed in autumn.

Only nine species are known to belong to this genus, which may be regarded as circumpolar, though most of the species are confined to the Pacific shores of the Arctic regions.

The Puffins are almost exclusively oceanic birds, only frequenting the coasts to breed. They are gregarious at all times of the year. Their mode of flight resembles that of the Ducks, their short wings being moved with great rapidity, and the line of direction being generally straight, with no perceptible undulations. They swim with ease and are very expert divers. Their food is principally fish. Their notes, which are seldom uttered, are harsh. Their single egg is laid either under rocks or in holes burrowed in the soft ground, and but little nest is formed. Their eggs are dull white, indistinctly spotted with brown and grey.

FRATERCULA ARCTICA.

PUFFIN.

(Plate 45.)

Fratercula fratercula, *Briss. Orn.* vi. p. 81 (1760).
Alca arctica, *Linn. Syst. Nat.* i. p. 211 (1766); **et auctorum plurimorum**—(*Naumann*), (*Macgillivray*), (*Baird, Brewer, & Ridgway*), (*Dresser*), (*Saunders*), &c.
Alca labradorica, *Gmel. Syst. Nat.* i. p. 550 (1788).
Alca canogularis, *Meyer, Taschenb.* ii. p. 442 (1810).
Mormon arctica (*Linn.*), *Illiger, Prodr.* p. 283 (1811).
Mormon fratercula (*Briss.*), *Temm. Man. d'Orn.* p. 614 (1815).
Fratercula arctica (*Linn.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 42 (1816).
Lunda arctica (*Linn.*), *Pall. Zoogr. Rosso-Asiat.* ii. p. 365 (1826).
Mormon polaris, *Brehm, Isis*, 1826, p. 985.
Fratercula (Ceratoblepharum) arctica (*Linn.*), *Brandt, Bull. Ac. St. Pétersb.* ii. p. 348 (1837).

The Puffin is one of the best known of British sea-birds, and is found in all suitable localities along the entire coast-line of our islands during summer. In rocky districts it is much more numerous than on low-lying coasts, and it is especially abundant at Lundy Island, Priestholm off the coast of Anglesey, the Isle of Man, the Hebrides (especially St. Kilda), the Orkneys, Shetland, and the Farne Islands. It is also equally common on the Irish coasts.

The Puffin is a North-Atlantic species, ranging, during the breeding-season, from Smith's Sound and the coasts of Labrador in the west, to Spitzbergen and the Varanger Fjord in the east. It is a resident in Nova Scotia, South Greenland, Iceland, the Faroes, and on the west coasts of Europe from the North Cape to the mouth of the Tagus, though a considerable number migrate southwards in autumn and others leave the shores to feed out at sea. Its winter range in America extends as far south as New York. It rarely enters the Baltic, and is not known to breed there; but in winter it wanders as far south as Gibraltar, and enters the Mediterranean, where it occurs as far east as Italy. The Puffin increases in size, especially in the height of the bill, the further north it is found; and examples from Spitzbergen and North Greenland may fairly be regarded as subspecifically distinct under the name of *Fratercula arctica glacialis* *.

* The synonymy of the Northern form is as follows:—

Mormon glacialis, *Leach, fide Naum. Isis*, 1821, p. 782, pl. 7. fig. 2.
Fratercula glacialis (*Leach*), *Steph. Shaw's Gen. Zool.* xiii. pt. 1, p. 40, pl. 4. fig. 2 (1825).
Fratercula arctica, *var.* glacialis, *Coues, Key N.-Amer. B.* p. 340 (1872).
Fratercula arctica glacialis, *Ridgway, Nom. N.-Amer. B.* no. 743 *a* (1881).

In the North Pacific (in Behring Sea) the Puffin is represented by a distinct though very nearly allied species, *F. corniculata*, which is a slightly larger bird. The black on the throat extends to the base of the bill, and the horny appendage above the eye is more elongated.

There can be little doubt that the Puffin is more or less a resident in the British seas, but it is less frequently observed in winter, when it is scattered over a large area, seldom approaching the land. The breeding-stations are entirely deserted when the young are able to take to the water; the sea in the immediate neighbourhood is almost as seldom visited, only a few stragglers being occasionally seen. At the Farne Islands the lighthouse-keeper told me that the Puffins return to their old haunt about the first week in March; but in the Shetlands it is said they do not arrive until the beginning of April; and in St. Kilda Dixon was informed that the first of May was the date of their appearance. They leave their breeding-stations again in early autumn, as soon as the young are able to leave the nest-holes, and shortly afterwards almost desert the locality for the remainder of the year. Saxby states that they leave Shetland with remarkable punctuality about the 23rd of August; and the same date applies to St. Kilda, Ailsa Craig, the Farnes, and other places.

The Puffin is one of the most gregarious of sea-birds, and in a few favourite localities its numbers are almost incredible. It spends a great deal of its time in the water, and may frequently be seen in thousands, studded over the surface of the sea, every now and then diving in search of food. It is a very expert diver, and usually prefers to seek safety by plunging under the surface rather than by flight. It expands its wings at the moment of diving, and absolutely flies under water with great speed and sometimes for a long distance. Notwithstanding its somewhat small and narrow wings, which seem almost incapable of bearing such a plump little body through the air, it is a bird of remarkably rapid and powerful flight. Sometimes it rises in a lazy sort of way from the sea, flapping along the surface, splashing the water with its wings, apparently for its own enjoyment; but at other times it mounts rapidly into the air on whirring wing and is soon far away. In spite of its short wings it often flies very gracefully, guiding itself with its two bright orange-red legs spread out behind, twisting and turning almost without any visible effort. Dixon, when in St. Kilda, often saw hundreds of Puffins careering about the air for a quarter of an hour or more without alighting. In places where their haunt is rocky, great numbers of Puffins may often be seen clustered on the ledges of rock, or even clinging in large masses to the boulders. They often mingle with Razorbills and Guillemots on the steepest part of the cliffs, every now and then one or two birds darting off to plunge head foremost into the boiling sea below. The Puffin swims well, sitting rather high in the water, where its large bill and queer facial

expression give it an absurdly comical appearance. It is very tame, allowing a boat or steamer almost to pass over it ere it dives in an instant from view, reappearing at a little distance to watch the approaching stranger. Even when fired at it shows very little fear, and, in spite of the warning conveyed by a fallen comrade, numbers will return to the same piece of rock which was vacated at the report of the gun. The Puffin sits upright, resting on the foot and tarsus, but it does not walk on its tarsus, as the Guillemot and Razorbill do.

The food of the Puffin is principally composed of small fish and the fry of the larger ones, especially of that of the herring and the coal-fish. In addition to this fare, it also catches marine insects, and often dives to the bottom of the sea in search of mollusks. Like the Guillemot, the Puffin often goes a long distance to feed, sometimes, it is said, fifty miles or more, visiting a favourable locality, remaining all day, and returning in the evening to its distant colony. Bunches of Puffins may often be seen flying swiftly along just above the surface of the sea, on their way to and from a favourite feeding-ground. It is often met with at a considerable distance from land, sitting unconcernedly on the water, but usually diving instantly at the approach of a boat. As a rule, the Puffin is remarkably silent. Even in colonies that are composed of tens of thousands of birds, little noise is to be heard beyond the humming of the myriad pinions striking the air at once. Its note is a grating noise, usually uttered when the bird is taken in the hand, and varies from *o-r-r* to *a-r-r*, as the bird is angry or pleased, and almost becomes a purr when the old bird is feeding the young.

The breeding-season of the Puffin commences early in May. By the end of April the birds are busy at work excavating a new hole or overhauling that of the previous year, and a week or ten days afterwards the single egg is laid. Puffins breed in colonies, sometimes only composed of a score or so of birds, but very often of a score or more thousands. Low flat islands covered with turf, rocky islets (as the Bass and Ailsa Craig), or bold headlands (as those of Flamborough) are the places usually selected. Sometimes, however, it takes up its quarters in a rabbit-warren, breeding in the deserted burrows; and at others it rears its young amongst the clefts and crannies of the cliffs or under the thickly strewn rock-fragments. Both birds assist in making the burrow; but the male, it is said, performs the largest share of the work. When the colony is on a cliff, the holes are usually burrowed in the soft soil near the top, and in other places on the grassy slopes midway down the side of the rock. The holes vary considerably in depth and size; many birds breed close together, and sometimes two pairs will live in the same burrow. There is a large colony of Puffins at the Farnes: it is situated on a low islet covered with turf to a depth, in some places, of two

feet. In this turf are almost innumerable burrows like rabbit-holes; they extend from three to four feet underground, and often branch out into various passages. At the end of the hole a slight hollow is formed and lined with a little grass or roots, upon which the solitary egg is placed. When first laid, the egg of the Puffin is pale bluish white in ground-colour, very indistinctly spotted and blotched with pale brown and violet-grey. Some eggs are much more finely marked than others, having both kinds of spots large and distinct, sometimes confluent and forming an irregular zone round the large end, or elongated into fine scratchy streaks. Most of the markings are underlying ones. The eggs vary in length from 2·6 to 2·2 inch, and in breadth from 1·75 to 1·6 inch. It is not easy to confuse the eggs of the Puffin with those of any other British bird; but some finely marked examples might be mistaken for very poorly marked eggs of the Kittiwake. The egg soon becomes discoloured by contact with the bird's wet feet and the soil of the burrow in which it is laid, and when much incubated is completely coated over with peat. Both birds assist in hatching the egg, and incubation lasts about a month.

The slightly spotted egg of the Puffin is an exception to the almost universal rule that eggs laid in holes are unspotted white; but the faintness of the spots suggests the idea that the bird has comparatively recently adopted the habit of breeding in a hole, and is consequently gradually losing its power of depositing coloured spots on its eggs. The colour-glands are probably disappearing, according to the well-known law of "degradation from disuse." It can scarcely be supposed that there could be any conscious use on the part of the bird, or effort to use, a colour-gland; but it may be assumed that the degradation of an organ naturally takes place unless it be kept up to the mark, either by effort to use it, or by the weeding-out by natural selection of those individuals who neglect to do so.

The young bird remains in the nest for some considerable time after it is hatched, in some cases probably till it is able to fly, and is carefully fed and tended by both its parents. At first the nestling is fed with disgorged fish, but afterwards it eats small fishes as they are brought in by the old birds. The young await their parents' arrival with food at the mouth of the burrow, but if alarmed they hastily retreat into the nest again. As soon as the young are able to get to the sea they never return to the nest, and very soon afterwards the breeding colony is deserted by young and old, who wander far from home in search of the fry on which they largely feed.

Dixon describes the Puffins on St. Kilda as follows:—"St. Kilda is the paradise of Puffins; every available place is burrowed and honeycombed with their holes, and the sea is often black with the birds. So abundant are they on Doon (an islet of the St.-Kilda group) that there

is scarcely sufficient room for all of them to burrow in the legitimate manner, so that many have to take refuge under the large masses of rock lying on the steep grassy hillsides that slope down to the sea, and others have to lay their egg amongst the heaps of rocks and in the crannies of the cliffs, in similar situations to those chosen by the Razor-bills. When I landed on Doon, in search of Fork-tailed Petrels' nests, the Puffins in a dense whirling throng, swept out from their holes and from their perching-places on the rocks, flying down the slopes towards the sea; then many of them rose in the air and circled high above our heads. It would be a difficult task to estimate the number of birds, and as they flew rapidly down the banks, as close together as they could fly, it put me in mind of a mass of shale slipping down a bare hillside. I never heard a single bird utter a note of any kind; but the noise made by such countless thousands of rapidly moving wings was very considerable. I thought the Puffins were abundant on Doon, until I saw them leave the mighty cliff of Connacher, when their numbers seemed almost past belief. As the report of the gun echoed and re-echoed amongst the rocks, the Puffins in a dense cloud swept out to sea, like a huge swarm of bees, looking quite black against the tens of thousands of Fulmars that rose startled from their nests; and even then probably not one bird in ten took wing. Puffins are a delicacy highly prized by the St.-Kildan. Next to the Fulmar, they are his favourite food, and the cliffs are full of snares set for their capture. Men and women, young and old, even the young children join in the chase of the 'Bougir,' taking them from their nest-holes, capturing them with a rod on which is fastened a horsehair noose, or in snares made of the same material, placed in every accessible part of the cliffs. The birds are simply plucked, drawn and salted, and hung up to dry in long strings across the ceilings of the cottages, where the smoke from the turf-fire aids in curing them. One of these mummified Puffins, grilled in the ashes, ranks amongst the few dainties these bleak and lonely islands can afford! The feathers are exported in considerable quantity."

The Puffin is smaller than a Duck, and is about the size of a Teal.

There is no difference in the colour of the sexes, and it is not known that there are any seasonal changes of plumage in adult birds. The forehead and crown are greyish brown, the rest of the upper parts being glossy black, and a ring of the same colour passes round the neck, leaving the throat white; the underparts below the ring are pure white, except the axillaries and under wing-coverts, which are brown, and the underparts above the ring extending above the eye are white suffused with grey. The bill has the terminal half of both mandibles carmine, followed by a narrow band of pale yellow, and the basal half slate-grey, followed by another pale yellow band at the base of the upper mandible, and a red one at the

base of the lower; legs and feet orange; irides hazel; orbits carmine; bare horny skin above and below the eye slate-grey; loose skin at the gape yellow. After the autumn moult the sheath of the basal half of the bill is cast, as are also the warty red skin round the gape and the two appendages above and below the eye. Young in first plumage closely resemble adults in colour, but the throat and sides of the head are more suffused with grey, especially the lores; the bill is also less than half the depth, somewhat resembling that of the Razorbill in shape, and yellowish-brown in colour; the legs and feet are much duller in colour. Birds of the year closely resemble adults, except that the bill is intermediate. Young in down are uniform blackish brown.

Genus ALCA.

The Auks were placed by Linnæus partly in the genus *Colymbus* and partly in the genus *Alca*. The latter is recognized in the twelfth edition of the 'Systema Naturæ' (i. p. 210). The Razorbill, *A. torda* (being the *Alca alca* of Brisson), is the type.

The Auks may at once be distinguished from the Puffins by their nostrils. In the former genus the feathers at the base of the bill encroach on the nostrils, often partly concealing them; in the latter genus there is always a bare space on the bill between the feathers and the nostrils, and the bill is provided with orange-red sheaths, which are deciduous in autumn.

There are only twelve species of Auks, but one or two of them are divisible into subspecies. The genus may be regarded as circumpolar, but some of the species are confined to the Pacific coasts of the Arctic regions. Seven species are European, all of which either breed on our shores or are visitors in winter or on migration.

The Auks are thoroughly maritime in their habits, frequenting the open sea, only visiting the rock-bound coasts to breed. They are more or less gregarious at all times of the year, and breed in large colonies. They swim and dive with great ease, but on the land walk clumsily and, when perched, usually sit on the tarsi as well as the feet. Their food consists principally of small fish and fry, crustaceans and mollusks. They are very silent birds, and their only note is a guttural sound. They make no nest, but lay their eggs, which only in the Black Guillemots exceed one, in crevices of the rocks or on ledges. Their eggs are remarkably handsome and vary considerably in colour and form.

ALCA IMPENNIS.

GREAT AUK.

(Plates 40 & 41.)

Alca major, *Briss. Orn.* vi. p. 85, pl. vii. (1760).
Alca impennis, *Linn. Syst. Nat.* i. p. 210 (1766); **et auctorum plurimorum—** *Temminck, Naumann, Dresser, Saunders,* &c.
Pinguinus impennis (*Linn.*), *Bonn. Tabl. Encycl.* i. p. 28 (1790).
Alca borealis, *Forst. Syn. Cat. Brit. B.* p. 29 (1817).
Plautus impennis (*Linn.*), *Steenstrup, Nat. For. Vid. Medd.* 1855, p. 114.
Chenalopex impennis (*Linn.*), *Gray, Hand-l. B.* iii. p. 95 (1871).

The Great Auk was once a British bird, now it is regarded as an extinct species, like the Solitaire Pigeon of Rodriguez, or the Phillip-Island Parrot, the Dodo of Mauritius Island, or the Moa of New Zealand. The extinction of the Great Auk has taken place during the lifetime of the present generation. It is scarcely more than half a century since the last British example of this curious bird was killed, and ten years later the survivors of the only colony left were captured, and the history of the Great Auk became a legend of the past.

Two hundred years ago the Gare Fowl or Great Auk was known as a regular summer visitor to St. Kilda; but as long ago as 1758 its visits had become irregular, though a bird was caught alive near the islands as late as 1821. One of the examples in the British Museum was obtained about 1812 on the island of Papa Westra, one of the Orkneys, where Bullock tried in vain to catch one, probably the same bird, a few weeks earlier, whose mate was killed a short time before his visit. The only other authentic instance of the occurrence of the Great Auk in the British Islands is that of an example caught in a landing-net in Waterford Harbour, in May 1834, and now in the Trinity College Museum in Dublin.

The Great Auk was a semi-Arctic Atlantic species, breeding on the islands off the coasts of Newfoundland, Labrador, South Greenland, Iceland, the Faroes, and probably on some of the islands on the coast of Norway. In winter it appears to have wandered as far south as the coasts of Carolina in the west, and the shores of Jutland in the east; but there is no authentic record of its having ever been seen as far north as the Arctic circle.

The most interesting question in the history of the Great Auk is the cause which led to its decrease and final extinction. There can be little doubt that this was its inability to fly. A bird the size of a goose (an example caught in 1809 on the Faroes is said to have weighed eleven

pounds), with a wing no larger than that of a small duck, was of course utterly unable to raise itself from the ground or from the water. A powerful bird, it had probably few enemies with which it was unable to cope, until man appeared upon the scene; but even from him its unrivalled power of diving secured it from danger, except during the breeding-season. Birds like the Guillemot, the Razorbill, the Gannet, and the Kittiwake, which frequented the same feeding-grounds as the Great Auk, found safety for their eggs on the ledges of overhanging rocks, or the summit of inaccessible cliffs; but the Great Auk could only shuffle along the gentle slope of some lonely strand, and deposit her egg a few yards above high-water mark, trusting only to the ceaseless swell of the Atlantic to wreck the canoes of invading robbers. It appears never to have entered into the calculation of the earlier generations of Great Auks that sooner or later evolution would produce a race of sailors to whom no flat coasts would be impregnable; one generation after another used their wings less than their ancestors had done, each generation left to its descendants the heritage of a neglected and consequently dwarfed wing, until in process of time all power of flight was lost, and the wing became a rudimentary appendage, only used as a supplementary aid to the tail in steering under water like the flappers of a Penguin or the fins of a whale. There can be little doubt that the small wings of the Great Auk were the result of *degradation by disuse*; this and the corresponding *development by use* are two factors in the process of evolution to which by far too little importance is attached; they are in fact direct causes of variation, which are cumulative without any aid from natural or other selection, and act independently of any struggle for existence. It is scarcely possible to imagine any benefit to be derived from a reduction in the size of the wings of the Great Auk from the standard of the ancestors of the genus, nor can we regard this diminution as a case of the survival of the fittest, inasmuch as the species did not survive. The Great Auk perished because it was unable to fly, and consequently could not find a place where its egg was safe.

The Great Auk appears to have been a common bird at one time. Hakluyt states that three hundred and fifty years ago it was numerous on the Island of Penguin, off the coast of Newfoundland, and Capt. Whitbourne described their abundance in 1620, hundreds being caught at a time on a flat island near that coast; but in 1819 this wholesale slaughter had caused the Great Auk to become extinct there. The statement that in 1574 a boatload of Gare Fowls were obtained by an Icelander on Danell's Islands, implies that three centuries ago the Great Auk was very abundant off the coasts of South Greenland, but it appears to have lingered longest on the neighbouring coasts of Iceland. In 1813 it was still abundant on the rocky islands off the south-west coast, and as late as 1844 a couple of Great Auks were caught on an island called Eldey, though in 1830

the reef on which the birds previously bred was destroyed by an earthquake.

During the last forty years nothing has been seen of the Great Auk, but there are seventy-seven skins of the bird in various public and private museums, and about seventy eggs. Many more or less complete skeletons exist, and great numbers of its bones have been found in the kitchen-middens of Denmark, one or two places in Scotland, Durham, and on the American coast.

Very little is recorded of the habits of the Great Auk, but its diving-powers are described as being very wonderful. Bullock chased one for many hours in a six-oared boat, but failed to shoot it in consequence of the rapidity with which it was able to pursue its course under water. Fleming also describes the ease and rapidity with which a captured bird was able to swim and dive. It was said (Gurney, 'Zoologist,' 1868, p. 1450) to have stood very erect and to have had a habit of frequently shaking its head in a peculiar manner, more especially when any particularly favourite food was presented to it. There is more than one passage implying that the Great Auk was capable of being tamed, so as to follow its master for food; but it is said that it seldom lived long in confinement. It is described as walking and running with its body in a nearly perpendicular position; but its rate of progress is said to have been slow, not much quicker than a man can walk, so that when surprised on land it was easily caught. Wolley, when making inquiries respecting the habits of the Great Auk in Iceland, was told by many people that they swam with their heads much lifted up, but their necks drawn in; they never tried to flap along the surface of the water when pursued, but dived immediately.

As the Great Auk had no means of ascending perpendicular cliffs, and was obliged to reach its breeding-grounds from some part of the shore where the rocks sloped gently down to the sea, and naturally chose a locality above the reach of storms or high tides, its eggs were generally found further inland than those of the Razorbill or Guillemot. It does not seem to have been difficult to approach, but is said to have been more easily alarmed if any noise was made. Like most of its kind it was doubtless a comparatively silent bird; but Naumann was informed that its note was loud and hoarse, somewhat resembling the syllables *ahngla*.

It was more or less a gregarious bird, especially during the breeding-season, but solitary pairs are said occasionally to have been found breeding in the company of Razorbills and Guillemots.

The food of the Great Auk was fish, which its unrivalled powers of diving enabled it to procure with ease. It may also have fed upon other marine animals which frequent the open sea or the shore. It doubtless made no nest and laid only one egg, which is said to have been deposited during the first half of June. As in the allied species, the egg is large in proportion

to the size of the bird, varying from 5·1 to 4·7 inch in length, and from 3·1 to 2·8 inch in breadth. The ground-colour is a creamy white, with black or dark brown surface-markings and grey underlying spots. Most of the eggs still remaining in collections resemble the common type of eggs of the Razorbill, and are somewhat sparingly spotted, the markings being largest and most irregular in shape round the large end. Of this type the egg figured on Plate 40 is an unusually fine example. It was formerly in the collection of Sir W. C. Trevelyan at Wallington, but is now in the Oxford Museum. A much rarer type is that in which the markings are principally streaks. The egg figured on Plate 41 is by far the handsomest of the streaked eggs known to exist. It was formerly in the possession of Lord Derby, but is now in the Liverpool Museum.

The Great Auk is a giant Razorbill, though its wing is not quite so large as that of its small ally. The shape of its bill is nearly the same, long, high, and very narrow, with the same transverse ridges, though the white grooves between them are less conspicuous. The general colours of the plumage are the same, but the white line from the eye to the base of the bill is expanded into a large oval patch. The sexes are alike, and, as in the Razorbill, the black chin and throat changed, probably by a moult, into white in autumn. In young in first plumage the feathers of the upper parts have pale margins, the general colour of the plumage is browner, the white patch on the sides of the face is only faintly indicated, the throat is brown streaked with white, and the bill is smaller and without transverse ridges. Young in down are said to have been dark grey.

ALCA TORDA.

RAZORBILL.

(Plate 42.)

Alca alca, *Briss. Orn.* vi. p. 89 (1760, adult).
Alca minor, *Briss. Orn.* vi. p. 92 (1760, young).
Alca torda, *Linn. Syst. Nat.* i. p. 210 (1766, adult); **et auctorum plurimorum**—*Gmelin, Latham, Temminck, Audubon, Baird, Dresser, Saunders*, &c.
Alca pica, *Linn. Syst. Nat.* i. p. 210 (1766, young).
Alca baltica, *Gmel. Syst. Nat.* i. p. 551 (1788).
Pinguinus torda (*Linn.*), Pinguinus pica (*Linn.*), } *Bonn. Encycl. Méthod.* i. pp. 29, 30 (1790).
Utamania torda (*Linn.*), Utamania pica (*Linn.*), } *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 42 (1816).
Alca glacialis, *Brehm, Vög. Deutschl.* p. 1004 (1831).
Chenalopex torda (*Linn.*), *Gray, Hand-l. B.* iii. p. 95 (1871).

The Razorbill is a very common bird on almost all parts of the British coasts that are sufficiently rocky to afford it a suitable place for its nesting-colonies. It is found breeding more or less abundantly on all sea-rocks from Cornwall to Shetland, round the Irish coast, the Channel Islands, and St. Kilda. During winter it strays down the more low-lying coasts, and has been known to wander some distance inland in stormy weather.

The Razorbill is probably an exclusively North-Atlantic species. It breeds on the coasts of Nova Scotia, Newfoundland, and Labrador, but does not enter Hudson's Bay or Davis Straits. Its range extends eastwards along the coast of Greenland as far north as lat. 70°, to Iceland, the Faroes, the British Islands, and the north coast of France. Thence its breeding-grounds are to be found wherever the coast is rocky on the shores of the North Sea and the Baltic, the coasts of Norway and the White Sea, where it was found breeding by Henke on the island of Onega. It reaches the most northern limit of its range at the North Cape, apparently not wandering as far north as Spitzbergen or as far east as Nova Zembla. The statement of Pallas that it is found sparingly on the north coast of Siberia, and abundantly on the shores of Kamtschatka and the Kurile Islands is probably an error, as it is entirely unconfirmed by Middendorff, Nordenskiöld, or other recent travellers. The only record of its occurrence in the Pacific is the somewhat doubtful one of a single individual obtained by the Dutch expedition, the ornithological discoveries of which were recorded by Temminck and Schlegel in the 'Fauna Japonica.' To the northern portions of its range it is only a summer visitor, migrating

in winter on the American coast as far south as New York, and in Europe as far south as Gibraltar, frequently entering the Mediterranean, and occasionally straggling as far east as Sicily. The Razorbill has no very near ally.

Like the Guillemot and the Puffin, the Razorbill is a resident in the British seas, but appears to be less numerous in winter than in summer, because it is spread over a much wider area, and lives for the most part out at sea. In its habits it very closely resembles the Guillemot, but it is easily distinguished from that bird, even at a considerable distance, by its deeper bill and conspicuous white stripe from the eye to the base. It is gregarious at all times of the year, and in some places literally swarms. In summer it comes to the rocky headlands and wild precipitous islets to rear its young; but from its partiality for clefts in the rocks rather than ledges it is almost absent from many places where the Guillemot breeds in great abundance, as, for instance, the "Pinnacles" in the Farne Islands. The Razorbill is most at home in the water, where it vies even with the fish in activity and rapidity of movement. It floats on the heaving waves light and buoyant as a cork, sitting well out of the water, its head and neck raised high above its back, very similar to a Duck or a Diver. It swims with ease, paddling along at times very quickly, and often indulges in a frolic in the water, splashing about with its wings, chasing its companions, and being chased by them in turn. It often sleeps on the water, tossed about seemingly at the mercy of the waves, but quite safe, even in the roughest water. It is by no means a shy bird, and frequently allows a boat or a vessel to approach it within a few yards ere it takes wing or dives. Like the Guillemot and the Puffin, it is an expert diver, vanishing from view with great rapidity, leaving tiny air-bubbles to mark the place of its descent. It dives for a considerable distance below the surface, either in pursuit of a small fish or to search for crustaceans and mollusks hiding in the crevices of the rocks and amongst the seaweed at the bottom. The Razorbill, in spite of its narrow and comparatively small wings, flies well, but does not rise very easily from the water, generally splashing along for a few yards ere it gets well into the air. It never appears to fly about like the Puffin, and when it leaves its perch on the rocks generally darts headlong down into the sea, and, when leaving the water, soon makes for the rocks again. The flight is performed by rapid and incessant beatings of the wings. The Razorbill is a clumsy object on the land, and very rarely attempts to walk far, progressing in a hobbling kind of way. This bird often goes long distances to feed, and then its flight can be seen to perfection, as the little troop of birds, usually in single file, pass rapidly along just above the surface of the waves.

The food of the Razorbill is composed principally of small fish, especially

of the fry of the herring and the coal-fish; these are often pursued under water with as much dexterity as the Swallow chases an insect in the air. The Razorbill flies under water aided by its webbed feet; it is capable of remaining under the surface for a long time, and when submerged not only catches fish, but searches for crustaceans, mollusks, &c. The note of this bird, which is rarely heard, may be described as a low croaking sound.

The Razorbill is a rather late breeder, its egg being seldom laid before the middle of May. About the end of March, or early in April, the birds begin to assemble at the familiar breeding-places, and the precipices, rocky islets, and sea around are alive with them. Razorbills probably pair for life, and yearly return to the old niche or cranny to deposit their eggs; and I have in my collection three remarkably large eggs taken in three successive years from a hole in one of the Flamborough cliffs; one of these is represented on the lower figure on Plate 42. If the locality be well suited to it, great numbers of birds breed together on the same range of cliffs, but in less eligible districts the pairs are scattered. The great attraction is the presence of suitable crannies amongst the cliffs where it can lay its egg; ledges are shunned; the Razorbill must have a hole if one can possibly be obtained. The eggs are deposited in the cliffs at various heights from the water, but seldom very close to the sea, and generally near the summit. As a rule, in those localities where the birds are abundant and can be observed, the Razorbills are seen to cluster on one part of the cliffs, the Guillemots on another, the Puffins generally at the top of all, and the Kittiwakes lowest. Only one egg is laid, sometimes far out of reach in a cleft of the rocks, at other times in a crevice or a niche only a foot or so in depth. Occasionally the bird chooses less likely places. Dixon took an egg from a Puffin-burrow in the turf on the top of Doon, and was told by a native that the bird regularly returned to this particular spot; whilst Saunders once saw a Razorbill sitting on its egg in the old nest of a Cormorant. Both birds assist in the task of hatching the solitary egg, and incubation lasts about a month, but it is said that the male sometimes feeds the female.

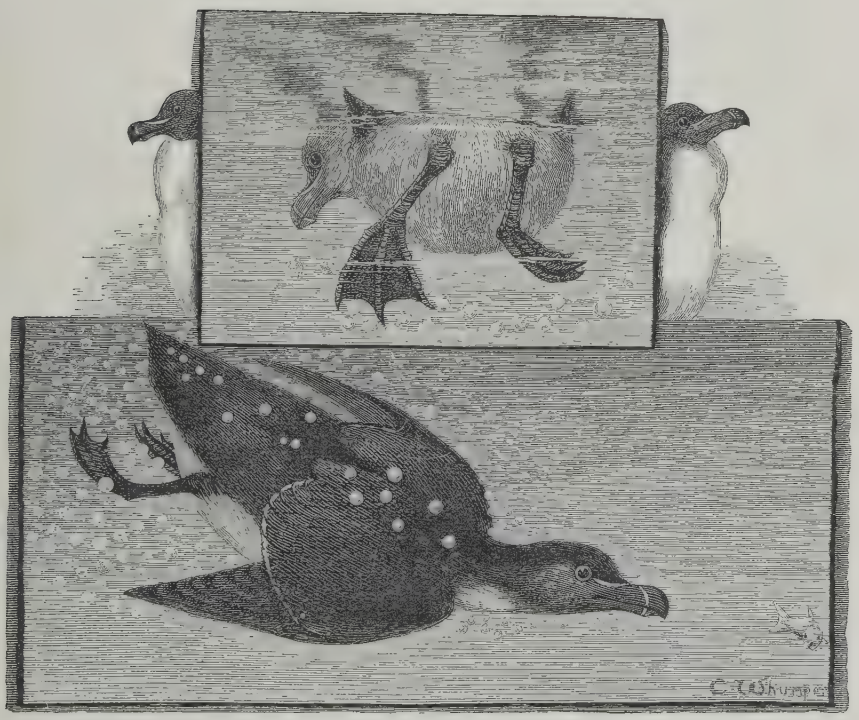
The eggs of the Razorbill vary very much, but the range of variation, both in the colour and shape of the spots, is not nearly so great as in those of the Guillemot. A remarkable difference between the eggs of these two birds is to be found in the fact that whereas those of the latter species, when viewed through the hole against the light, sometimes appear cream-coloured and sometimes green, the eggs of the Razorbill, when examined in the same way, *always* look green, though on the surface they never show more than the faintest tint of that colour. The ground-colour of the eggs of the Razorbill varies from pure white to pale reddish brown. The colour of the overlying spots is dark reddish brown, sometimes

approaching black, and that of the underlying spots pale greyish brown; they vary in size from large blotches, often confluent round the large end, to the minutest speck. In rare instances a few streaks are mixed with the spots, and in still rarer instances most of the markings are streaks. The richest and handsomest eggs that I have seen are those from Lundy Island; those from the Yorkshire cliffs are, on an average, not quite so handsome; handsome eggs are still rarer in collections from the north of Norway, and rarest of all in those from St. Kilda. The normal eggs vary in length from 3·1 to 2·7 inch, and in breadth from 1·95 to 1·7 inch; but the three large eggs already alluded to vary in length from 3·75 to 3·55 inch, and in breadth from 2·25 to 2·2 inch.

The Razorbill only rears one nestling in the year, but if its egg be taken it will lay a second and even a third. Mr. Theodore Walker has observed that the young remain on the cliffs until they are nearly fledged, and when once on the water that they never revisit the cliffs, being fed and tended by their parents on the sea. When the young are fledged, the breeding-places are deserted for the remainder of the year, and the birds often go far out to sea or wander down the coasts in search of their finny prey. It is said that the young are sometimes conveyed to the water in the bill of the old birds, and that on the sea they are taught to dive by their parents.

The Razorbill is larger than the Puffin, but not quite so large as the Guillemot. There is no difference in colour between the sexes, but there is an important seasonal change of plumage. The general colour of the upper parts in nuptial dress is black, slightly glossed with green, and shading into brownish black on the wings and tail; the secondaries are narrowly tipped with white, forming a band across the wing, which is very conspicuous during flight; on each side, from the base of the ridge of the culmen, extending to the eye, is a narrow white streak; the chin and throat are brownish black; the remainder of the underparts, including the axillaries and under wing-coverts, are pure white. Bill black, with a curved transverse white line in the centre on each side; legs, feet, and claws brownish black; irides hazel. After the autumn moult the general colour of the upper parts is not so strongly suffused with green, the sides of the nape are mottled with white, and the chin, throat, and sides of the head are pure white, uniform in colour with the rest of the underparts; the narrow white line from the bill to the eye is also much less clearly defined. Young in first plumage very closely resemble adults in winter plumage, but the upper parts are browner, the wing-bar is suffused with buff, the narrow white line from the bill to the eye is nearly obsolete, and the bill is much smaller, without the furrows and the white transverse stripe on each side. After the first spring moult the adult nuptial plumage is almost completely assumed, but the bill, although presenting the white trans-

verse stripe, has only two instead of three transverse grooves which characterize that of the old bird. Young in down have the forehead and underparts greyish white, and the rest of the upper parts brownish black. When they are about half-grown they assume a plumage which is half down and half feathers, and scarcely differs in colour from that of the adults in summer.



RAZORBILLS IN THE TANKS AT THE ZOO.

ALCA ALLE.

LITTLE AUK.

(Plate 45.)

Uria minor, *Briss. Orn.* vi. p. 73 (1760).
Alca alle, *Linn. Syst. Nat.* i. p. 211 (1766); **et auctorum plurimorum**—*Gmelin, Latham*, (*Naumann*), (*Dresser*), (*Saunders*), &c.
Alle nigricans, *Link, Beschr. Nat.-Samml. Univ. Rostock*, i. p. 17 (1806).
Mergulus alle (*Linn.*), *Vieill. Analyse*, p. 67 (1816).
Mergulus melanoleucos, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 42 (1816).
Uria alle (*Linn.*), *Pall. Zoogr. Rosso-Asiat.* ii. p. 369 (1826).
Cephus alle (*Linn.*), *Less. Traité d'Orn.* p. 639 (1831).
Mergulus arcticus, *Brehm, Vög. Deutschl.* p. 994 (1831).
Arctica alle (*Linn.*), *Gray, List Gen. B.* p. 98 (1841).

The Little Auk is only a winter visitor to the British Islands, and is most common in the extreme northern portions, especially in the Orkneys and Shetland. Further south it is only known as a somewhat rare straggler, but has been met with at various places on the Scotch and English coasts. It is also a winter visitor to Ireland, where its presence has probably been to a great extent overlooked, especially in the north. Numbers have been met with at great distances inland, blown from the sea by storms; but there is little doubt that many of the birds recorded as Little Auks from these inland localities are only young Puffins. Occasional examples have been obtained in the Channel Islands.

The Little Auk is an Atlantic species, but it only breeds north of the Arctic circle. It is most abundant on the coasts of Spitzbergen, where it is said to breed in countless thousands, and ranges eastwards as far as Franz-Josef Land and Nova Zembla, and westwards to Grimsey Island, north of Iceland, and to both shores of Greenland north of lat. 68°. In all these localities it is probably a partial resident; but during winter many wander southwards, and appear as gipsy migrants on the Atlantic coasts of America as far south as the shores of New Jersey. It has once occurred on the Azores, and is an irregular winter visitor to the Faroes, to the British Islands, to the coasts of France and Spain, and to the Canary Islands. It is more abundant at this season on the southern shores of the German Ocean and on the coasts of Norway and North Russia. The Little Auk has several allies in the North Pacific, none of them probably very close, and all of them distinguished by the shape of the bill, in which the chin-angle is nearer to the nostrils than to the tip.

The Little Auk is almost exclusively an oceanic bird, and seldom approaches land except during the breeding-season. It sleeps on the water,

with its head tucked under its wing, and in rough weather is often tossed from wave to wave without apparent injury. It is a very expert diver, and can fly with great rapidity, though it is obliged to move its short wings almost as quickly as a humming-bird or a hawk-moth. Its flight is without undulations, but it turns with great ease. It is one of the most gregarious of birds, and Arctic travellers have sometimes estimated the flocks to consist of millions. It does not appear to be very active on the land. It is said to sit on the tarsus as well as on the foot, but only rests on its feet when running. At all seasons of the year flocks of these little birds may be observed in the open Polar seas, diving in search of food or perching on the masses of ice. Unlike the Guillemot and Razorbill it is a very noisy bird, and its notes are constantly uttered both when on the wing and when at rest, either on the rocks or on the ice-floes, or even when sitting on its egg. Its specific name of *alle* is said to bear a slight resemblance to its note.

The Little Auk appears at its breeding-places early in May, pairing having already taken place; but the eggs are not laid until the middle of June. It rarely breeds at any high elevation, but lays its single egg in some crevice, or under the loose stones that have fallen from the cliffs, occasionally at some distance from the coast. Both parents take their share of the duties of incubation. The egg is pale greenish blue, occasionally indistinctly streaked round the large end with yellowish brown, and varies in length from 1·9 to 1·8 inch, and in breadth from 1·35 to 1·2 inch.

Soon after the young are hatched their parents convey them to the sea, where they may often be seen long before they are able to fly. The breeding-places are now deserted, and the little birds wander about the open ocean in search of their favourite food. In rough weather they are said to come nearer to the shore, and to frequent the land-locked bays and quiet fjords. They seem but poorly adapted to withstand any violent storm, and are soon driven exhausted ashore, often for some considerable distance inland. The Little Auk only rears one nestling in the year, but it probably lays again if its first egg is taken.

The food of the Little Auk is principally composed of minute crustaceans, and probably small fish and marine insects. When engaged in rearing its young, it appears to store a great quantity of these small crustaceans in its mouth, visibly puffing out its cheeks, as Swallows and other insect-feeding birds do, so that it may convey a large amount of food to its distant nestling at once.

Dr. Hayes ('The Open Polar Sea,' p. 390) very graphically describes his visit to a great breeding-place of the Little Auk near Foulke fjord on the Greenland coast of Smith's Sound (about lat. $78\frac{1}{4}^{\circ}$). He describes the slopes on both sides of the valley as about a mile wide, and consisting of piles of loose rocks, stretching for five hundred feet at an angle of

about forty-five degrees up to the cliffs, which rise about seven hundred feet higher. Along these slopes the Little Auks flew in a constant stream a few feet above the stones, occasionally alighting in thousands on the rocks, under which their eggs were deposited, and in the winding narrow passages, between which they found convenient places in which to deposit their eggs, secure from the foxes which prowl round in great numbers, ever on the look-out for a meal. The Esquimaux in this valley eat great numbers of these birds, which they catch in a very ingenious manner. Armed with a net attached to a long pole they conceal themselves among the rocks, and often catch half a dozen birds at a time by suddenly raising the net at the moment the flock is passing over their heads. Dr. Hayes saw more than a hundred birds caught in this manner in a very short time.

The Little Auk is a very small bird, scarcely half the weight of a Puffin, and less than a fourth of that of a Guillemot. There is no difference in colour between the sexes. In general appearance it very closely resembles the Razorbill, having in nuptial dress the general colour of the upper parts black, but, in addition to the white tips of the secondaries, the scapulars are broadly margined with white, and there is a small white spot over each eye; the chin and throat are black, but the rest of the underparts are white. The under wing-coverts are pale brown, and the axillaries are black on one web and white on the other. Bill black; legs and feet greyish brown, paler on the toes; irides hazel. After the autumn moult the chin, throat, and sides of the head are white, uniform with the rest of the underparts.

Young in first plumage closely resemble adults in breeding-plumage. After their first autumn moult they only differ from adults in their paler colouring, in the absence of the white spot over the eye, and in wanting the white margins to the scapulars. After their first spring moult they closely resemble their parents in nuptial dress. Young in down are uniform sooty brownish black.

ALCA GRYLLE.

BLACK GUILLEMOT.

(Plate 45.)

Uria minor,
Uria minor nigra,
Uria minor striata, } *Briss. Orn.* vi. pp. 73, 76, 78 (1760).
Colymbus grylle, *Linn. Syst. Nat.* i. p. 220 (1766); **et auctorum plurimorum**—(*Latham*), *Gmelin*, (*Temminck*), (*Naumann*), (*Dresser*), (*Saunders*), &c.
Cepphus lacteolus, *Pall. Spicil. Zool.* pt. v. p. 33 (1769).
Mergus troile, *Tunst. Orn. Brit.* p. 3 (1771, *nec Linn.*).
Colymbus gryllus (*Linn.*), *O. F. Müll. Zool. Dan. Prodr.* p. 18 (1776).
Colymbus lacteolus (*Pall.*), *Gmel. Syst. Nat.* i. p. 583 (1788).
Uria grylle (*Linn.*),
Uria lacteola *Pall.*), } *Lath. Ind. Orn.* ii. pp. 797, 798 (1790).
Uria nivea, *Bonn. Encycl. Méthod.* i. p. 37 (1790).
Uria leucoptera, *Vieill. N. Dict. d'Hist. Nat.* xiv. p. 35 (1817).
Uria scapularis,
Grylle scapularis, } *Steph. Shaw's Gen. Zool.* xii. pt. 2, pp. 250, 252 (1824).
Cephus grylle (*Linn.*), *Brehm, Vög. Deutschl.* p. 987 (1831).
Grylle groënlandicus, *Gray, List Gen. B.* p. 77 (1840).
Uria groënlandicus, *Gray, List Gen. B.* p. 98 (1841).

The stronghold of the Black Guillemot in Great Britain is the west coast of Scotland, including the Hebrides, Orkneys, and Shetland. It is not known to breed with certainty on the east coast of Scotland south of Sutherland. In Pennant's day it was said to breed on the coast of Wales, but is not known to do so now, although it still breeds sparingly in the Isle of Man. In Ireland it has deserted some of its former breeding-places, but still has colonies on the north coast. It occasionally wanders southwards in autumn, and has been known to range as far as Sussex, Devonshire, and Cornwall. It is only found inland accidentally after severe weather.

The Black Guillemot is a circumpolar species, which may be separated into two races—an Atlantic form with a subarctic distribution, and an Arctic Ocean form with an Arctic distribution. It is not known that these forms intergrade; but as they only differ in the amount of white on the wing-coverts, in precisely the same way as *Alca columba* differs from *A. motzfeldi*, the fact that the two latter species intergrade is presumptive evidence that the two forms of the Black Guillemot do so also. The Arctic form breeds on the coasts of Nova Zembla, Franz-

Josef Land, Spitzbergen, Grinnell Land, Baffin's and Hudson's Bays, and, according to Baird, Brewer, and Ridgway, of Labrador; but as the Atlantic subspecies is the form found in Newfoundland and South Greenland, the latter locality appears very doubtful. East of Nova Zembla, Nordenskiöld found it breeding on the east coast of the Taimur peninsula; the Naturalist of the 'Jeanette' observed it on Herald Island and Wrangel Land, and it was found breeding in great numbers on Bennett Island. It winters in Behring Sea, and possibly in small numbers in the Atlantic. The Atlantic form breeds in the Bay of Fundy, on the coasts of Newfoundland, Labrador, South Greenland, Iceland, the Faroes, Ireland, Scotland, Denmark, and the Baltic, on the Norwegian coasts, and eastwards as far as the White Sea, where it was found breeding by Henke at Onega. In winter it is found on the American coast of the Atlantic as far south as Massachusetts Bay, and in Europe on the shores of the German Ocean and the coasts of Northern France. In addition to the northern form already mentioned, which will probably bear the name of *Alca grylle mandti*, the Black Guillemot has a close ally in the North-Pacific *A. columba*, and its allies *A. columba carbo* and *A. columba motzfeldi*, all of which may be distinguished by having the under surface of the wing smoke-grey instead of white.

In its habits the Black Guillemot very closely resembles the Common Guillemot and the Razorbill. It is a bird of the sea, and only visits the rocks to rear its young. At all times of the year it is sociable, though perhaps never seen in such vast assemblies as the Common Guillemot. It is more usual to see half a dozen birds swimming and feeding together, sometimes close in shore, in the sheltered sea-lochs, paddling amongst the floating seaweeds and ever and anon diving to catch a tiny fish or search for crustaceans. The Black Guillemot loves a rock-bound coast; the surf is never too rough or the sea too stormy for this bird. It is by no means shy, unless repeatedly fired at, and allows a boat to approach quite close ere it dives with the rapidity of thought and again appears far out of danger. It swims most buoyantly, sitting high and lightly on the water, with head and neck extended. No bird rivals it in diving, and its progress under water, aided by its wings as well as its feet, is quite as rapid as its passage through the air. It dives with such rapidity that it is very difficult to shoot at a long range, disappearing at the flash of the gun and being safe from danger ere the shot strikes the water where it was sitting a moment before. The flight of the Black Guillemot is rapid, straight, often considerably prolonged, performed by incessant beatings of the small narrow wings, and is seldom elevated more than a few feet above the surface of the water. As it approaches the rocks the bird gradually rises

in a straight line from the sea, and alights abruptly on the cliffs. Flocks of a dozen or more of these birds may frequently be seen flying rapidly in strings over the surface of the water bound to or from a favourite fishing-ground. It walks but little on the land, though capable of doing so rather quickly, and it sits on the rocks like a Guillemot resting on the tarsus as well as on the foot. The Black Guillemot does not appear to wander about so much as the Common Guillemot, and obtains most of its food near home. It is abroad late in the evening, for it may often be seen fishing in the dusk, and it is one of the earliest birds astir at dawn. Many birds pass the whole night on the sea, sleeping safely on the water, but usually they retire to the neighbouring rocks at dusk. In winter it almost exclusively lives on the sea, only occasionally visiting the land.

The food of the Black Guillemot is principally composed of the fry of fish, especially of the coal-fish and herring, which literally swarm in many Scotch waters. In search of these fry it explores the water quite close to the rocks, often seeming only very narrowly to escape being dashed on them by the force of the waves. It also feeds largely on crustaceans and very small shellfish. The note of the Black Guillemot is described by Capt. Feilden as a plaintive whine; and Saxby describes that of the young birds as shrill but rather plaintive.

The Black Guillemot probably pairs for life, as year by year the same crannies and crevices of the rocks are tenanted, presumably by the same birds. It is a rather late breeder, its eggs being seldom deposited in Scotland before the end of May or the first week in June, and fresh eggs may be obtained all through the latter month. It makes no nest, but deposits its eggs either in a crevice of the cliff, it may be hundreds of feet above a boiling sea, or amongst the débris under the fallen rock-fragments at the foot of the cliffs. Sometimes they are laid under the large blocks of rock on the beach, and less frequently at considerable distances inland. Saxby states that he has found the eggs on grassy rock-strewn slopes fifty or sixty yards from the sea; and Evans and Sturge found this bird breeding in Spitzbergen a mile or two inland. Sometimes the eggs can easily be obtained from the niche or crevice, but at others they are almost inaccessible. They are almost invariably two in number, Macgillivray says that they are frequently three, and Audubon states that the latter number is the usual clutch. In general appearance they very closely resemble those of the Razorbill, but are easily recognized by their much smaller size. They are subject to but little variation, ranging in ground-colour from very pale buff or creamy white to very pale bluish green. The overlying markings are rich deep brown, some of them almost black, and vary in size from large irregular blotches to minute specks; many of

the blotches are confluent, and form in some instances an irregular zone round the large end. The underlying markings, which are often large and generally very conspicuous, are inky grey. Some eggs are much more sparingly marked than others, some are heavily blotched, whilst others are uniformly marked with small spots and a few streaks. They vary in length from 2·5 to 2·2 inch, and in breadth from 1·7 to 1·5 inch. Many eggs of the Black Guillemot very closely resemble those of the Sandwich Tern; but usually the tinge of green on those of the former species is sufficient to identify them. The eggs of the Black Guillemot are always heavier than those of the Sandwich Tern, the smallest weighing more than fifty grains, whilst the largest eggs of the latter species never quite reach that weight; the site in which they are laid also prevents any possibility of confusion. Both birds assist in the duties of incubation, but the male is said to feed the female while she is sitting on the eggs.

When its breeding-grounds are invaded, the Black Guillemot betrays but little anxiety, and is often remarkably tame, allowing the observer to approach the rock-crevices ere it takes flight. At the report of a gun the little birds appear at the entrance of the crevices, and peer restlessly about in search of the cause of alarm, and, if further disturbed, numbers dart out from the rocks with whirr of wing on their way to the sea. The young are said to remain in the crevices until almost fledged, and shortly after they visit the sea they are abandoned by their parents. The young birds are easily tamed, soon becoming engaging pets, but rarely long survive their capture. In autumn the young appear to congregate in flocks apart from the adult birds, and wander far from their birthplace. The old birds do not stray so far from home as the Razorbills and Guillemots, preferring to frequent the rocky coasts, bays, and fjords, although they have been noticed many miles away from land.

The Black Guillemot is about as large as a Puffin, but is a much smaller bird than the Common Guillemot. There is no difference in the colour of the sexes. In full breeding-plumage its colour is, as its name implies, a uniform black, slightly glossed with green, but the median and greater wing-coverts are white, with concealed black bases; the basal half of the inner web of the primaries is white, and the under wing-coverts and axillaries are also pure white. Bill black, red at the base; legs and feet vermilion; irides hazel. After the autumn moult the head and hind neck are white, mottled with black; the lower back, scapulars, and upper tail-coverts are black barred with white; and the rump and the whole of the underparts are pure white; but the wings and tail remain as in breeding-plumage. Young in first plumage closely resemble adults in winter plumage, but there is more brown on the head and neck, and the white

rump and patch on the wing are streaked with brown. After the first autumn moult they resemble very closely the winter plumage of adults, except that they retain the wing-coverts of the young in first plumage. After the second autumn moult they are still easily recognized by traces of brown on the white wing-patches, which are not lost until the third autumn moult. Young in down are uniform blackish brown.

ALCA TROILE AND ALCA BRUNNICHI.

COMMON GUILLEMOT and BRUNNICH'S GUILLEMOT.

(PLATES 43 & 44.)

The rediscovery of Pallas's Guillemot in Japan and Behring Sea has so completely bridged over the supposed interval between Brunnich's Guillemot and the Common Guillemot that it is impossible to regard the three or four forms as more than subspecifically distinct. For the sake of clearness the synonymy of each of the four forms is given.

ALCA TROILE BRUNNICHI.

BRUNNICH'S GUILLEMOT.

Alca lomvia, *Linn. Syst. Nat.* i. p. 130 (1758).
Uria svarbag, *Brünn. Orn. Bor.* p. 27 (1764).
Uria brunnichii, *Sabine, Trans. Linn. Soc.* xii. p. 538 (1818); **et auctorum plurimorum**—*Temminck, Gould, Audubon, Dresser*, &c.
Uria francsii, *Leach, Trans. Linn. Soc.* xii. p. 588 (1818).
Uria polaris, *Brehm, Vög. Deutschl.* p. 984 (1831).
Alca brunnichii (*Sabine*), *Malmgr. Œfv. K. Vet.-Akad. Förh.* 1863, p. 111.
Lomvia svarbag (*Brünn.*), *Coues, Proc. Ac. Nat. Sci. Philad.* 1868, p. 80.
Uria lomvia (*Linn.*), *Baird, Brewer, & Ridgway, Water-Birds N. Amer.* ii. p. 485 (1884).

ALCA TROILE ARRA.

PALLAS'S GUILLEMOT.

Cepphus arra, *Pall. Zoogr. Rosso-Asiat.* ii. p. 347 (1826); **et auctorum plurimorum**—(*Cassin*), (*Coues*), &c.
Uria arra (*Pall.*), *Cassin, Proc. Ac. Nat. Sci. Philad.* 1864, p. 324.
Lomvia arra (*Pall.*), *Ridgw. Nom. N.-Amer. B.* p. 57 (1881).
Uria lomvia arra (*Pall.*), *Baird, Brewer, & Ridgway, Water-Birds N. Amer.* ii. p. 485 (1884).

ALCA TROILE.

COMMON GUILLEMOT.

Uria uria, *Briss. Orn.* vi. p. 70 (1760).
Colymbus troile, *Linn. Syst. Nat.* i. p. 220 (1766); **et auctorum plurimorum**—*Gmelin*, (*Temminck*), (*Dresser*), (*Saunders*), &c.
Uria lomvia, *Scop. Ann. I. Hist. Nat.* p. 78 (1769).
Mergus lomvia (*Scop.*), Mergus lomvia minor, *Tunst. Orn. Brit.* p. 3 (1771).
Uria ringvia, *Lath. Gen. Syn. Suppl.* i. p. 295 (1787, Ringed variety, *ex Brünn.*).

Colymbus minor (*Tunst.*), *Gmel. Syst. Nat.* i. p. 585 (1788).
Uria troile (*Linn.*), *Lath. Ind. Orn.* ii. p. 796 (1790).
Uria troile leucophtalmos, *Faber, Prodr. Isl. Orn.* p. 42 (1822, Ringed variety).
Uria lacrimans, *Valenc. Choris, Voy. pitt. autour du Monde,* pl. 23 (1822, Ringed variety).
Uria leucopsis, *Brehm, Beitr. Vogelk.* iii. p. 880 (1822, Ringed variety).
Uria minor (*Gmel.*), *Steph. Shaw's Gen. Zool.* xii. pt. 2, p. 246 (1824).
Uria intermedia, *Nilss. Skand. Faun.* ii. p. 548 (1858).
Catarractes troille (*Linn.*), Catarractes ringvia (*Lath.*), *Bryant, Proc. Bost. Soc. Nat. Hist.* viii. pp. 136, 139 (1861).
Alca lomvia (*Scop.*), *Schleg. Mus. Pays-Bas, Urinatores,* p. 15 (1867).
Lomvia troile (*Linn.*), Lomvia ringvia (*Lath.*), *Coues, Proc. Ac. Nat. Sci. Philad.* 1868, pp. 75, 78.

ALCA TROILE CALIFORNICA.

Californian Guillemot.

Catarractes californicus, *Bryant, Proc. Bost. Soc. Nat. Hist.* 1861, p. 11; **et auctorum plurimorum**—(*Baird, Brewer, & Ridgway*), &c.
Lomvia californica (*Bryant*), *Coues, Proc. Ac. Nat. Sci. Philad.* 1862, p. 79.
Lomvia troile californica (*Bryant*), *Ridgw. Proc. U. S. Nat. Mus.* 1880, p. 212.
Uria troile californica (*Bryant*), *Baird, Brewer, & Ridgway, Water-Birds N. Amer.* ii. p. 483 (1884).

There are two forms of the Common Guillemot, which some naturalists regard as distinct species, others as varieties, whilst many look upon the Ringed Guillemot as an accidental sport of frequent occurrence. So far as is known, wherever one form occurs, both in the Atlantic and the Pacific, the other is found with it, the proportion of Ringed Guillemots varying in different localities from one in five to one in twelve of the Common Guillemot. It is not known whether the young of the Ringed Guillemot has always a ring; but the two forms have frequently been seen paired together, and the white line behind the eye is said to vary in length, leading to the supposition that intermediate forms are found. It has been regarded by some naturalists as a case of dimorphism; but this term is generally applied to cases where two females which differ from each other have the same male. It seems to be well established that the difference has nothing to do with age, sex, or season; but the specific distinction between the two forms must be left an open question until it can be ascertained that the characters are hereditary. In the meantime it is better to keep the nomenclature distinct, though we may treat the two forms as one species, since no difference in their habits is known to exist.

The Guillemot is a plain, not to say uninteresting, looking bird; but of all British sea-fowl, none are associated with so much that is attractive and romantic. The picturesqueness of its breeding-grounds, the numbers in which the birds congregate together, the busy stirring scene

of thousands of birds coming and going, flying in the air and swimming in the sea, and, above all, the wonderful variety and beauty of its eggs, combine to make a visit to a breeding-place of the Guillemot unusually interesting, not only to the ornithologist, but to every lover of nature.

In winter the Guillemot is generally dispersed on the British coasts, but keeps further out to sea than in summer, and is consequently less frequently observed. From May to August during the breeding-season its distribution is more restricted, the low-lying coasts are abandoned, and the birds by universal impulse crowd to bold rocky headlands, islets, and sea-girt cliffs, for the purpose of rearing their young. It breeds in all suitable localities like these, from the Isle of Wight in the south, up to the north of Scotland, including all the Hebrides and Western Isles, the Orkneys and the Shetlands, and isolated St. Kilda. The Guillemot during the short season when it visits the land is a bird of the rocks; and it may be regarded as a universal rule that where there are ocean cliffs on the shores of our islands, the Guillemot will be found upon them.

The Guillemot is a circumpolar bird, but varies somewhat in the shape of its bill in different parts of its range, those breeding furthest north having a short stout bill and passing under the name of Brunnich's Guillemot. This form breeds in enormous numbers on Spitzbergen, Nova Zembla, and Franz-Josef Land, ranging in the west to Grimsey Island, north of Iceland, across Greenland north of lat. 64°, presumably at least as far as Melville Island, and in the east to some unknown point on the coast of Arctic Siberia, where a form with a longer bill (Pallas's Guillemot) takes its place and joins the western limit of the range of Brunnich's Guillemot somewhere on the American shores of the Arctic Ocean. Pallas's Guillemot breeds in Kamtschatka and North Alaska, but it is not known how far its range extends either to the east or west north of Behring Straits. The Common Guillemot has a still longer bill and is a more southern Atlantic form, breeding in the Bay of Fundy, Nova Scotia, Labrador, Greenland south of lat. 64°, Iceland, the Faroes, Bear Island (where, under the influence of the Gulf-stream, it reaches the high latitude of 74°), and the north-west coasts of Europe as far south as North France and as far east as the Varanger fjord, between Norway and Russia. There is also a southern form in the Pacific Ocean, which is said sometimes to have a bill still longer than the longest-billed examples of the Common Guillemot. This form is called the Californian Guillemot, and breeds on the American coast of the Pacific Ocean as far north as the Pribylov Islands in Southern Alaska, and as far south as the Farallones off the coast of San Francisco. All these races vary considerably *inter se*, and an almost perfect series from the shortest and stoutest to the longest and slenderest may be obtained. It is not known that they differ in the slightest degree in their habits.

The Guillemot becomes more numerous, and the breeding-stations are more densely populated, towards the extreme northern limit of its range. It does not appear to be found on the shores of the Baltic, except as an accidental visitor. In winter it is found further south: it occurs off the coasts of Belgium, and a few stragglers go as far south as the coasts of North-west Africa; but it is an extremely rare bird in the Mediterranean. Its occurrence in the Canaries is not fully confirmed. On the American continent it winters as far south as the southern coasts of New England and California, and in Asia as far south as Japan.

For the greater part of the year the Guillemot's haunt is the open sea; but in the breeding-season it retires landwards to its favourite cliffs and rocky islets. A nursery of these birds presents one of the most interesting phases of bird-life. Whether it be the brave old headland cliffs of Flamborough and Bempton, the curious "Pinnacles" at the Farnes, the rugged coasts of Wales, the innumerable nurseries on the Scottish rocks and islets, or a "fuglevœr" among the Norwegian fjords—all possess abundant attractions for the naturalist, and well repay repeated visits.

So soon as the breeding-season has passed, even before the young birds have fully gained the use of their wings, the Guillemots forsake the cliffs and spend the rest of the year upon the open sea. A rocky shore is now no more attraction to them than a low and sandy one, and they may be frequently seen in the sea off such low-lying coasts as Lincoln and Norfolk. The Guillemot is to some extent a migratory bird, but is perhaps better described as a wandering one, straying hundreds even thousands of miles from its breeding-place and its true home. Certain it is, we know on good authority, that the birds are never seen on the cliffs at Flamborough or at the Farnes for several months after the young are reared. On Heligoland the birds reappear during the months of November and December, at least half of them being young ones; and in some of the migration-reports the Guillemot is returned as appearing at its breeding-places suddenly, and just as suddenly leaving them again when the duties of the season are over.

The Guillemot is an expert diver, very often diving so suddenly as to defy the quickest shots, often disappearing at the flash of the gun, to rise again at some distance quite unharmed. We have but little opportunity, if any, of observing the bird's aquatic gambols in its own native ocean; but the Guillemots in the saltwater tanks at the Brighton Aquarium are a source of never-ending interest and amusement to visitors. Using their wings much after the manner that a fish does its fins, they progress through the water, darting hither and thither with great rapidity. In swimming the Guillemot uses its legs as a motor, but in diving the wings alone are used: the whole body of the bird is covered with a mass of air-bubbles, and

it leaves a train of these bubbles behind it, glistening like silver and pearls, which adds much to the beauty of the performance. Sometimes the descent of the bird is perpendicular, sometimes in an oblique direction; and its progress under the water is made apparently as easily as through the air, even more so, turning and gliding about with ever graceful movements, and sometimes hovering over a morsel of food like a Tern. The Guillemots at the aquarium rarely stay under the surface more than half a minute; but in the open sea I have known them remain down for a much longer time.

The Guillemot is a gregarious and social bird, allowing other species (as Gulls, Mergansers, Black Guillemots, and Ducks) to mix freely with its gatherings on the sea. Where the birds are at all numerous, it is an interesting sight to watch their motions in the water. If you climb to the summit of their rocky home, and look down upon the bird-studded waves below, you may see them in thousands and thousands, like little black and white balls, incessantly disappearing and rising again as they pursue their finny prey. Where the food-supply is, there the Guillemots congregate. A shoal of fry is out yonder in the deep water, half a mile from shore. You can trace its proportions and its position by the actions of the Guillemots in the sea above the moving millions of young fish, whilst above the Gulls and the Terns are gathered together, filling the air like snowflakes. What an animated and pretty scene it is! The birds on the dark green sea like foam-flecks, the mighty waves dashing against the cliffs, the ever-moving myriads of birds upon them, the clear blue sky, with here and there a mass of cloud drifting slowly across, and the noisy Gulls and Terns in ever-restless airy flight around. But the shoal of fry passes on, the birds follow in its course, and the sea seems deserted once more. Sometimes the Guillemots have to pass long distances to their feeding-grounds, the Flamborough birds often going to the Lincoln and Norfolk coasts to fish, returning in the evening in little "knots," or in long "strings" like Wild Ducks, flying swiftly and silently just above the surface of the waves. At Scarborough about sunset long strings of Guillemots may often be seen flying at an almost incredible speed close to the surface of the waves in the direction of Flamborough.

The food of the Guillemot is largely composed of the fry of fishes, notably that of the herring; but this fare is also varied by small crustaceans, marine insects, mollusks, and various small fish. This food is often obtained near the coasts, in sheltered bays and estuaries, where the birds congregate in large numbers; but at night they generally go out to the open sea, except during the breeding-season. The Guillemot is often caught in the herring-nets, and is sometimes taken on the hooks baited with small fish. It takes its prey, if it be a fish, crosswise, and

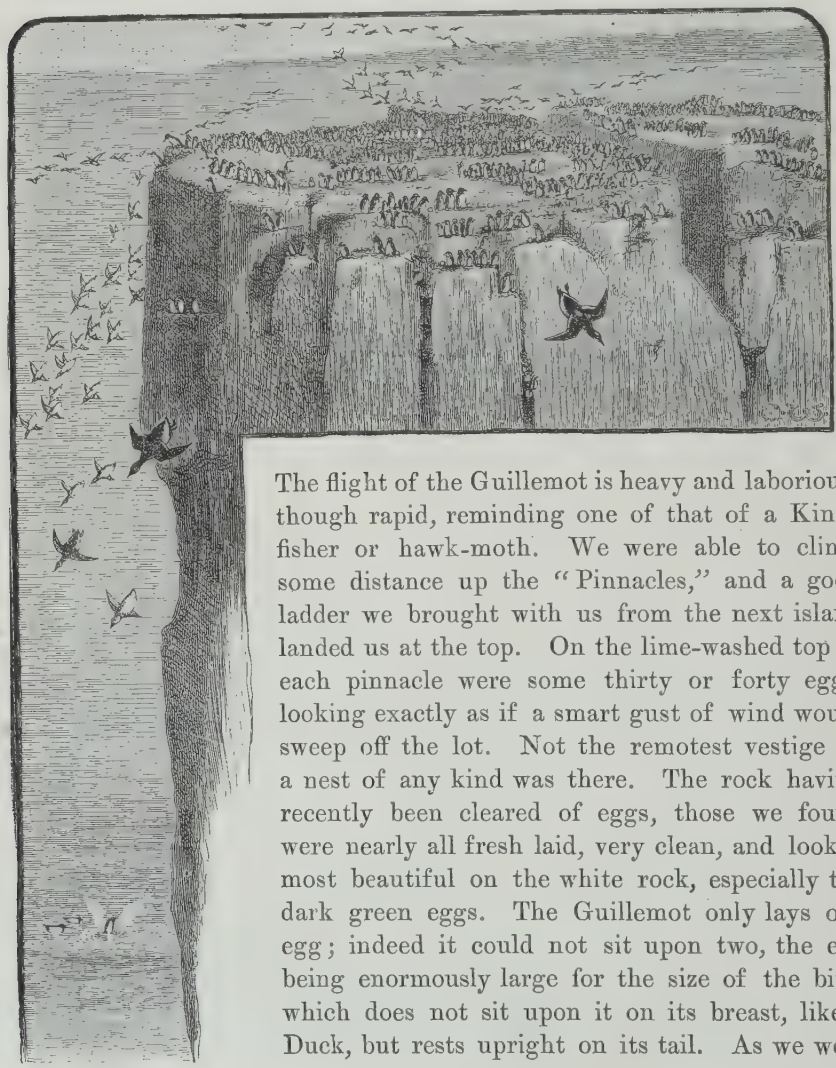
swallows it after changing its position. The young birds are fed by their parents on portions of fish, and even when they are sufficiently matured to seek the water they are still tended by the old birds.

As a rule the Guillemot is a remarkably silent bird; and no matter how large its colony may be but little or no noise is heard, save the whirr of their short wings as they leave the ledges, and an occasional hoarse guttural note as they struggle for a point of vantage on the rocks. When seriously alarmed they often utter this note whilst wheeling round an intruder's head; but the Guillemot rarely utters a sound, and allows its eggs to be taken or its privacy disturbed without offering any noisy resistance or remonstrance.

The breeding-season is the time when the Guillemot's habits are most interesting and the easiest to observe. During that period, which commences in May and lasts until August, the birds are confined to the rocky headlands and the isolated rocks. Among the breeding-places of the Guillemot the cliffs at Flamborough and Bempton probably stand unrivalled, so far as the British Islands are concerned; but I know of no place where sea-birds can be studied to greater advantage than at the Farnes. I have visited these islands many times, and every time I have been more charmed than before.

But very few Guillemots are to be seen on the Farne Islands or the neighbouring coasts during winter. The lighthouse-keeper told me that they make their appearance *en masse* in March, visiting the "Pinnacles" about sunrise at first, and remaining but a very short time, disappearing out to sea again. Every day they make a longer stay than on the previous one; and about the beginning of May they begin to lay, and then remain altogether. On the Farne Islands there is but one breeding-station of these birds, the islands being naturally low and affording them but little accommodation. The first colony of birds which we visited on one of my visits to these islands was that of the Guillemots. Whilst our little craft was scudding along before the wind, the mast bending to the sail, and sometimes too far removed from the perpendicular to be altogether agreeable to our landsman's nerves, especially when our lee bulwark dived just under water for a second or two and the spray dashed over us, we could see some two miles ahead a group of rocks called "The Pinnacles," standing out conspicuously, like great white-washed crags, in front of one of the islands. They stand out some 50 feet from the cliffs of the adjoining island, of which they at one time probably formed a part, and are some 40 feet high, the summit of each being a tolerably level platform about 12 or 15 feet square. The top and more than halfway down the sides are completely white-washed with the droppings of the birds; and on the leeward side the smell of guano is strong, but not offensively so, as the lime almost overpowers the ammonia and entirely absorbs the sulphuretted

hydrogen. The top of these "Pinnacles," at the time of our visit, was one dense mass of Guillemots, and as we approached all became excitement. Streams of Guillemots poured off every corner in long strings like Wild Ducks, but for some time the dense mass seemed to get no less. In every direction shoals of Guillemots were hurrying and skurrying away over the sea almost as far as the eye could reach. Some desperate individuals took a header from the top of the rocks, and flinging out their legs so as to make a threefold rudder with the tail, plunged at once into the sea and dived out of danger. By the time we had landed an anchor the rocks were nearly cleared, and for a mile or more away the sea seemed covered with birds.



The flight of the Guillemot is heavy and laborious, though rapid, reminding one of that of a Kingfisher or hawk-moth. We were able to climb some distance up the "Pinnacles," and a good ladder we brought with us from the next island landed us at the top. On the lime-washed top of each pinnacle were some thirty or forty eggs, looking exactly as if a smart gust of wind would sweep off the lot. Not the remotest vestige of a nest of any kind was there. The rock having recently been cleared of eggs, those we found were nearly all fresh laid, very clean, and looked most beautiful on the white rock, especially the dark green eggs. The Guillemot only lays one egg; indeed it could not sit upon two, the egg being enormously large for the size of the bird, which does not sit upon it on its breast, like a Duck, but rests upright on its tail. As we were

leaving the rocks we saw an anxious maternal Guillemot alight behind her egg, which, with a quiet poke of her bill, she pushed between her legs. The Guillemot's egg is laid bare and exposed on the face or summit of the cliff, without any attempt being made to conceal it.

The cliffs at Bempton, another noted nursery of the Guillemot, are very much like those at Flamborough, a nearly perpendicular wall of chalk and flint between 300 and 400 feet high. This great sea-wall is fast crumbling away with the action of wind and tide; it looks as if it had been built of flints, with chalk for mortar. Sometimes there seems to be as much mortar as stone, and often there is scarcely any, and, in fact, it then looks like a dry wall. The outline of the coast is very irregular; some parts of the cliffs are harder than others, and stand out to sea as promontories, while others are soft and have apparently been washed away into caves and little fjords. Here and there the cliffs have cracked, and then you can look down and in some places climb down through the rift to the sea. The top is covered with a thick bed of soil, which slopes steep down to the edge of the cliff, and is generally grown over with grass cropped short by rabbits. This steep slope is rather dangerous, and it is seldom that a view of the face of the rock can be obtained, except from the opposite promontory. On the ledges of these precipitous cliffs the Guillemots breed in great numbers, sometimes so densely crowded together as to remind one of a swarm of bees: they fly about in all directions, and numbers constantly arrive and others leave the ledges; whilst far away in the sea, down at the bottom of the cliffs, hundreds of birds are swimming about, the whole scene being full of life and activity and bustle.

The eggs of the Guillemot are much sought after as articles of food. The manner in which they are taken from the cliffs at Flamborough is very interesting. A party of "climmers" consists of three, two at the top and one suspended in mid-air. The latter, in consequence of the greater risk he has to run, takes one half of the eggs as his share. This adventurous man must have a clear head, or he would become giddy at the fearful depths below him; he must not be too heavy, or he would tire out the two men who have to lower and raise him some 200 feet or more twenty times a day; whilst, at the same time, he must have a good knowledge of the various ledges and crannies where the birds breed. He first puts on what he calls his "breeches," a belt of flat rope with a small loop at each end, to which the cord by which he is suspended is attached, and two large loops, through which he puts his legs. An iron bar is driven into the ground, to which a rope is attached to hang down the cliff to assist him in raising himself, and with which to make signals to the men above when he wants them to raise or lower him. A pulley running on a swivel attached to an iron spike is fastened on the edge of the precipice, so that the rope may not chafe.

With a cool head the dangers attached to "climming" are very slight indeed; the real danger consists in pieces of the rock becoming detached and falling on the unfortunate climmer. Old Lowney, the Methuselah of cliff-climbers, the veteran of forty years amongst these awful cliffs, told me how he had "clum" for six-and-thirty years, and had met with only one really serious accident. A piece of rock, about half the size of his head, detached itself some thirty feet above him, and, though he saw it coming, he could not get out of its way; if it had fallen on his head it must inevitably have dashed his brains out, but he put up his arm to protect himself. His arm was not broken, but the muscle was absolutely torn from the bone, and it was nearly two years before he could raise it to his head again. He divides his ground into three days' work, so that he takes it all twice a week, when weather permits; in very wet and windy weather he does not "clim." Operations commence about the 14th of May. For the first nine days he has a good run of eggs, as the birds that breed on the ledges he visits have most of them laid; for the next nine days eggs are scarce. At the end of that time a second egg has been laid by the birds whose eggs he took during the first nine days, and he has a second run of successful collecting. He considers from two to three hundred eggs a day a good take. He has then a second nine days' "slack," and after that comes his midsummer "fling" or "shut," as he comically expresses it. This is a very precarious one, and in some seasons is not worth the getting, whilst in others it is nearly equal to the first two takes. This veteran "climmer" is of opinion that the Guillemot never lays more than two eggs in a season; and his opinion is of some value, as it is certainly much easier to obtain accurate information respecting the habits of birds at a place like Flamborough, where they are scattered over some miles of cliffs, than at the Farne Islands, where they are crowded together in a dense mass on only four rocks. He also thinks that each bird frequents the same ledge year after year, and lays the same coloured egg every year, although the variety of colour in the eggs of different birds is so wonderfully great. He told me that he used to get a very rare and highly-prized variety, of an almost uniform rich reddish-brown colour, on a certain ledge twice every year, which continued for fifteen years in succession, after which the poor bird died, or was shot or became a "shunted dowager."

The variety in the colour of the eggs of the Guillemot is something wonderful, and it is almost vain to attempt a description of their diversified tints. The ground-colours are cream, white, blue and yellowish green, dark and clear pea-green, and reddish and purplish brown, with every conceivable intermediate tint. Some are irregularly blotched, others are fantastically streaked with browns, pinks, or greys in endless variety, whilst a few are spotless or nearly so. The chief thing that strikes an

ornithologist who has been accustomed to estimate the eggs of the Guillemot by the Farne-Island standard, and afterwards visits Flamborough, is the extraordinary beauty and variety of colouring in the eggs found at the latter station. Not only are the colours more varied, but they are decidedly more brilliant. This may be owing to the fact that at the Farnes the eggs are all open to a careful selection by the collector, who only takes the richest and handsomest eggs; whilst at Flamborough, from the extreme inaccessibility of the birds' laying-places, the finely marked eggs have as much chance of coming to maturity as the plainer ones. At the Farnes a bird laying a handsome egg has rarely a chance of bringing it to maturity, and hence has no means of transmitting its extraordinary beauty to posterity. When eggs resemble Razorbill's in colour they are creamy white when held up to the light instead of green. They vary in length from 3·5 to 3·0 inch, and in breadth from 2·0 to 1·85 inch. An abnormally large egg measures 3·7 by 2·2 inch, whilst small eggs are accidentally found of almost any size down to that of a Pigeon's egg.

Upon the Bass Rock, in the Firth of Forth, the Guillemot also breeds in considerable numbers, but in far more inaccessible situations than at the Farnes. The eggs are deposited upon the ledges of the rocks and in the fissures, sometimes close together, at other times alone. I have taken a great many of the eggs of this bird, and obtained them from all parts of the cliffs, yet I cannot remember ever finding an egg in such a situation that it could easily be rolled off into the sea below. The supposition that the egg of the Guillemot is so formed as to turn round on its own axis, instead of rolling over the rocks, is a mere fanciful theory. No doubt the eggs of the Guillemot will turn on their axis to a surprising extent; but there is no reason to think that they depend thus for their safety, or that this coincidence is in any way connected with the conditions under which the Guillemot's eggs reach maturity. The eggs are placed in crevices of the rocks, in the hollows, and amongst the rugged interstices, where they lie comparatively safe. The birds, however, should they be hurriedly disturbed from their eggs, frequently dash them over the rocks in their eagerness to leave them. I have often been amused, when exploring the cliffs for the eggs of this bird, to see an old Guillemot pushing her egg from under her feet as we approached, previous to quitting the rocks for the sea beneath; and it is very probable the birds thus carefully leave their eggs when they do so of their own free will. The Guillemot usually sits with its back to the sea, thus hiding its conspicuous plumage from view; but when disturbed the birds turn round and make ready for quitting the ledges. By noticing which way the birds are sitting, a pretty good idea may be gained of the number of eggs.

The manner in which the young Guillemot safely reaches the sea from its lofty birthplace has given rise to much controversy and dispute. That

young birds, totally incapable of flight, are seen on the sea is an undisputed fact; but the means by which they get there is the vexed question. Many ornithologists believe that the young bird is conveyed to the water below by its parent; and the veteran "climmer" Lowney positively assured me that he had seen the old bird in the act of conveying her young down to the sea on her back. About halfway down the little creature slipped off: the mother flew round and round it, screaming as if in alarm; but the young bird swam away all right, and did not seem injured by the fall. After all there is nothing very wonderful in this procedure, for many of the Swans and Grebes may be seen repeatedly with their young upon their backs. Waterton's observations of the Guillemots at Flamborough confirm Lowney's story.

The Guillemot is about as large as a small Duck, but possesses little variety in the colours of its plumage. The adult in breeding-dress has the entire head and neck, together with all the upper parts, dark brown, with a slaty tinge on the back; wings dark brown, with the secondaries tipped with white; the whole underparts below the throat pure white, the flanks and under wing-coverts streaked with dusky grey. Bill black; legs and feet dark olivaceous; irides hazel. The female does not differ from the male in colour. After the autumn moult the upper parts are darker in colour, the throat and sides of the head are white, like the rest of the underparts, but a dark streak passes from behind the eye through the white on the side of the head. Young in first plumage very closely resemble adults in winter plumage, but the brown of the upper parts has no slate-grey tint, the white on the underparts is more suffused with brown on the sides of the neck and breast, and the bill is shorter and paler. After the first spring moult young birds scarcely differ from adults, except that the bill is not so large nor so black. Young in down have the upper parts brownish black, and the underparts greyish white. When half-grown the belly becomes whiter, but it extends in a narrow line along the centre of the breast and throat, which do not become black as in the Razorbill at the same stage of plumage.

The Ringed Guillemot differs from the Common Guillemot by having a ring of white round the eye, and a narrow streak of the same colour extending backward and downward from the eye. Its geographical distribution is the same as that of the Common Guillemot, both birds, as has already been remarked, always being found in company; but it is a much rarer bird, its proportions to the common race being, on an average, one to ten. In the British Islands this percentage varies considerably in different localities. In Handa and Ailsa Craig the Ringed species is in about the proportion of one to ten or twelve; in the Hebrides it is about one to five. At the Bass the Ringed birds are rare; at the Farnes the percentage is about one to ten of the common species; whilst at Bempton and Flamborough the proportion of the Ringed birds is about one to five.

It is not known that the forms recognized as Brunnich's Guillemot, Pallas's Guillemot, or the Californian Guillemot ever possess either the white ring or the white line behind the eye. The eggs of the Ringed Guillemot are not distinguishable from those of the common form, and are subject to the same variations.

Brunnich's Guillemot only differs from the common bird in the shape of the bill, and in having the base of the upper mandible pale horn-colour, a peculiarity also found in Pallas's Guillemot. It is a very rare straggler to the British Islands during autumn and winter. It has been most frequently observed in the Orkneys and extreme north of Scotland, but there can be little doubt that it is often overlooked and confused with its smaller-billed ally.

Family COLYMBIDÆ, or DIVERS.

The Divers are a well-defined but very small family of birds, containing only one genus, which consists of only four or five species. They are probably nearest related to the Auks, though the majority of ornithologists consider them to have still closer affinity with the Grebes. Sclater places the Grebes between the Divers and the Auks, the three families composing the order Pygopodes. Forbes placed the Divers, the Grebes, and the Ducks in a group by themselves. Gadow also associates the Divers with the Ducks, regarding them as forming with the Cormorants and the Penguins three much specialized families descended from the same ancestors as the less modified family of Ducks. In the arrangement of their palatal bones the Divers most nearly resemble the Grebes, the Auks, and the Gulls; in the arrangement of their feather-tracts the Divers resemble the Auks to some extent, but most closely the Grebes. There is only one small notch on each side of the posterior margin of the sternum in the Divers, and the lateral processes do not extend so far as the central projection.

The principal external characters of the Divers are their webbed feet, furnished with a well-developed hind toe, their nearly straight elongated sharp-pointed conical bills, moderately long wings, and short tails. The Divers resemble the Grebes and the Cormorants in having the tarsus laterally compressed so as to cut the water like a knife, and they also resemble the latter birds in having the hind toe on the same plane as the others, and the fourth toe the longest.

Divers are born covered with down, and are able to swim shortly afterwards. The adults moult all their feathers in early autumn, and begin to assume their nuptial plumage before the end of the year; but the young retain their first plumage until early spring, when they, like their parents, moult their small feathers only into summer plumage, which differs in many conspicuous ways from that of winter. The plumage of both sexes is alike; but after the spring moult birds of the year are less brilliantly coloured than adults, though it is said that they are found breeding in this plumage.

The Divers are arctic or semi-arctic birds, confined to the Nearctic and Palæarctic Regions.

Genus COLYMBUS.

The Divers were associated by Linnæus with the Guillemots and the Grebes in the genus *Colymbus*, which was recognized in the twelfth edition of the 'Systema Naturæ,' published in 1766 (i. p. 220). According to the Stricklandian Code of Nomenclature the Great Crested Grebe (*Podiceps cristatus*), being the *Colymbus colymbus* of Brisson, the type of a genus additional to that of Linnæus, becomes the type of the genus *Colymbus*. As this would involve the transfer of that name from the Divers to the Grebes, and the adoption of some almost unknown name for the former, it is obvious that the rules must be honoured, in this case, in the breach and not in the observance. To disturb the name of *Colymbus* for the Divers or that of *Podiceps* for the Grebes (names which they have almost universally borne for more than a hundred years) would be a violation of the spirit of the Rules, to preserve a pedantic adherence to the letter, which no one would have condemned in stronger terms than Strickland himself. The only possible alternatives are either to tear up the Rules and consign them to the limbo of good intentions, or to make a special exception to provide for the case (which will thus become an exception to an exception). Probably the latter alternative will be the wisest. The Great Northern Diver (*Colymbus glacialis*) has by common consent been accepted as the type.

The characters and geographical distribution of the genus are the same as those of the family, which does not include any other genus.

The Divers are oceanic birds in winter, but they retire to inland lakes in summer to breed. They fly like Ducks, but can only progress with the greatest difficulty on land, in consequence of the backward position of their feet, which are formed for swimming and diving. Their notes are loud and harsh. Their food consists almost entirely of fish. They breed close to the water's edge, seldom making much nest. Their eggs are usually two in number, and are dark brown spotted with nearly black.

COLYMBUS GLACIALIS.

GREAT NORTHERN DIVER*.

(Plate 35.)

Mergus major, Mergus major nævius, *Briss. Orn.* vi. pp. 105, 120 (1760).
Colymbus glacialis, *Linn. Syst. Nat.* i. p. 221 (1766); **et auctorum plurimorum**—*Gmelin, Latham, Temminck, (Naumann), Dresser, Saunders,* &c.
Colymbus immer, *Linn. Syst. Nat.* i. p. 222 (1766).
Mergus glacialis (*Linn.*), Mergus nævia (*Briss.*), *Tunst. Orn. Brit.* p. 3 (1771).
Urinator glacialis (*Linn.*), *Cuv. Anat. Comp.* i. table 2 (1799).
Colymbus atrogularis, *Meyer, Taschenb.* ii. p. 449 (1810, *partim*).
Eudytes glacialis (*Linn.*), *Illiger, Prodr.* p. 283 (1811).
Cepphus torquatus, *Pall. Zoogr. Rosso-Asiat.* ii. p. 340 (1826, *ex Brünn.*).
Colymbus maximus, *Brehm, Vög. Deutschl.* p. 971 (1831, *ex Gunner*).
Colymbus torquatus (*Pall.*), *Keys. & Blas. Wirb. Eur.* p. xci (1840).
Urinator immer (*Linn.*), *Stejn. Proc. U. S. Nat. Mus.* v. p. 43 (1882).

The Great Northern Diver may possibly breed in some of the wild secluded lochs of the west of Scotland, the Outer Hebrides, the Orkneys, and the Shetlands, although no proof of the fact has been hitherto obtained; consequently it can only be regarded as a winter visitor to our islands, most abundant on the west coasts of Scotland and England. It occurs less frequently on the eastern coasts, but occasionally visits inland waters. In Ireland it is equally well known as a winter visitor, and as it is occasionally obtained in summer in full breeding-plumage, it may yet

* Dresser's statement that the Great Northern Diver is nearly circumpolar in its range is evidently founded upon a series of errors. There is no evidence of this species ever having occurred in the Old World east of the North Cape in Norway, except on the Asiatic shores of Behring Straits. The single example supposed to have been seen by Alston and Harvie-Brown near Archangel can scarcely be accepted as evidence. Henke never saw the bird, and the eggs which he obtained from the Kanin peninsula were probably those of *Colymbus adamsi*. Dresser's statement that I heard of it from the natives of the valley of the Petchora is probably a misprint for the valley of the Yenesay, and even then refers only to *C. adamsi*. Sabanäeff does not include it in the birds of the Ural District; and the Great Northern Divers seen by Heuglin on Nova Zembla were not obtained, and were probably *C. adamsi*. Finsch's statement that he saw it on the Obb was afterwards corrected by himself, and refers to *C. arcticus*. Middendorff expressly states that an example which he obtained on the Taimur peninsula had a yellowish-white bill, and must therefore be referred to *C. adamsi*. There appears to be no evidence of its occurrence in Japan, all the examples obtained from those islands having been found on examination to be either *C. arcticus* or *C. adamsi*.

be found breeding in some secluded corner of the "sister isle." As is usual, the greater number of birds that visit us are in immature plumage.

The Great Northern Diver appears to be a Nearctic species, breeding across the American continent from Greenland to Alaska, as far south as the Great Lakes. To the east it breeds in great abundance on Iceland, but it only occurs in the Faroes on migration. To the shores of Scandinavia it is principally known as a winter visitor. There is no evidence of its ever having bred on the continent of Europe, unless the occurrence of a fully-fledged bird on an island near Tromsö, on the 26th of August, may be accepted as such. It winters as far south as the Pacific and Atlantic coasts of Northern Mexico. To Southern Europe it is only known as an accidental visitor in winter, most of the examples obtained being in immature plumage.

Few birds are more completely aquatic in their habits than the Great Northern Diver: for three or four months during the breeding-season it frequents some inland lake, and spends the rest of the year on the ocean. It is rarely seen on land; its legs are placed very far back, so as to enable it to swim and dive with greater ease, and incapacitate it for walking without resting its breast on the ground. It is almost as rarely seen on the wing, except at the two periods of migration, but it can fly with great speed. The wings, which are also placed far back, are moved with great rapidity, the neck is outstretched, and the feet spread out to assist the tail by acting as a rudder. The flight is straight like that of a Duck. Although small flocks are occasionally seen on migration, it is not a gregarious bird, only on very large lakes are more than one pair to be met with in the breeding-season, and in winter seldom more than one or two birds are seen together. Like most large birds it is very shy, and if pursued generally seeks safety by diving. Holböll states that it has been observed to remain as long as eight minutes under water. It chooses the most secluded lakes for its breeding-quarters, and frequently selects a mountain tarn for this purpose, though never at any very great distance from the ocean. It arrives as soon as the ice disappears, late in May or early in June. The birds arrive ready paired, and no time is lost in selecting a site for the nest. An island is preferred; but if the lake does not contain one, the nest is built on the shore, near the water's edge, in the most exposed situation possible. This bird makes no attempt to conceal itself on the nest, but trusts to its keen eye and commanding position to see its enemy before it is itself seen, when it takes to the water, relying upon the protective colour of its eggs for their safety. Its mate is also always on the watch to give the alarm. The nest is very clumsily made and often very slight; it is composed of dead grass and decayed water-plants, and the sitting bird soon treads a pathway down to the water's edge.

Both sexes take it in turns to sit on the eggs. Two is the usual number, and it is doubtful if more are ever laid. They vary in ground-colour from olive-brown to russet-brown, and are somewhat sparingly spotted with black. The spots vary in size from that of a pea downwards, and are generally most numerous round the larger end. The underlying spots are much paler and are not very numerous. The eggs vary in length from 3·8 to 3·4 inch, and in breadth from 2·4 to 2·1 inch. The smaller eggs are indistinguishable from large eggs of the Black-throated Diver.

The Great Northern Diver is generally a very silent bird, but at its breeding-grounds its cries are often heard, and, like those of its allies, resemble the screams of tortured children; they sound very weird, and can be heard at a great distance over the water. Like its congeners, this Diver feeds almost exclusively on fish, which its unrivalled powers of diving enable it readily to procure. As soon as the young are able to fly, the breeding-grounds are deserted for the nearest sea-coast, where they are tended for some time by their parents.

The Great Northern Diver is a large bird, as big as a Goose, though more slender. The colour of the sexes is alike, but the female is slightly smaller in size. In nuptial plumage it almost exactly resembles the Black-throated Diver below the neck, except that the uniform feathers on the upper parts are also covered with small white spots like the wing-coverts. The head and neck are black, glossed with purple on the chin, upper throat, sides of the head, crown, nape, and hind neck, and with green on the lower throat and sides of the neck. Across the middle of the upper throat is a row of about a dozen short white streaks, and on each side of the neck a row of longer white streaks, of which there are about eighteen on each side. Bill black; legs and feet greenish black; irides crimson. After the autumn moult a plumage is assumed which can scarcely be distinguished from that of the Black-throated Diver at the same season of the year, nor can the two species be distinguished in young in first plumage, except by size. The dimensions of the wing overlap that of the Great Northern Diver, varying from 15 to 13 inches, and those of the Black-throated Diver from 13¼ to 12 inches; the depth of the bill at the nostril is a more reliable character, measuring in the former species from 1·0 to ·9 inch, and in the latter from ·8 to ·7 inch. Young in down are blackish brown on the upper parts, paler brown on the underparts.

COLYMBUS ADAMSI.

WHITE-BILLED DIVER.

Colymbus adamsii, *Gray, Proc. Zool. Soc.* 1859, p. 167; **et auctorum plurimorum** —*Sclater, (Baird, Brewer, & Ridgway)*, &c.
Colymbus torquatus, *var.* adamsii (*Gray*), *Coues, Key N.-Amer. B.* p. 334 (1872).
Urinator adamsii (*Gray*), *Stejneger, Proc. U.S. Nat. Mus.* v. p. 43 (1882).

The White-billed Diver was discovered about the year 1830 by Captain James Clark Ross, who obtained three examples of this magnificent species in Boothia, north of Hudson's Bay, during his cruise in the Arctic regions in the 'Victory' (App. Sec. Voy. N.W. Pass. Nat. Hist. p. xlii). Unfortunately Sabine persuaded Captain Ross, against his own better judgment, that the examples which he obtained were only very old males of the Great Northern Diver. One of these examples was presented to Audubon, and another of them may now be seen in the Museum of the Literary and Philosophical Society in Hull. Twenty years afterwards it was rediscovered by Mr. Adams, who obtained it in Alaska during the cruise of the 'Enterprise.' This example was described by Gray, who named it after its discoverer (Proc. Zool. Soc. 1859, p. 167). In 1852 a British example was shot at Pakefield, on the Suffolk coast, in early spring, and is now in the collection of Mr. J. H. Gurney (Sclater, Proc. Zool. Soc. 1859, p. 206). A second British-killed example, also in winter plumage, is in the Museum at Newcastle, and Mr. Hancock assures me that it was shot on the Northumberland coast, although the precise date is unknown.

The breeding-range of the White-billed Diver extends in the Arctic regions from Hudson's Bay across Alaska and Eastern Siberia at least as far as the valley of the Yenesay, and probably to Nova Zembla and the Kanin peninsula (see footnote on p. 402). In winter it has been known to stray as far south as Japan and the British Islands.

The White-billed Diver appears to be a very maritime bird, and rarely breeds far inland. Of its habits nothing whatever has been recorded, but they probably do not differ much from those of the Great Northern Diver. It appears to be very common in autumn in the islands of Norton Sound, in Alaska; and Adams says that the natives kill numbers of them, making bags for their tools out of the skins. They are said not to arrive in Norton Sound until the end of August. It was found breeding by MacFarlane on the Anderson River, but its eggs do not appear to have been described.

This species closely resembles the Great Northern Diver in the pattern

of its plumage, but may be distinguished at all seasons of the year by its large ivory-coloured bill. In summer plumage the forehead, crown, and nape are glossed with green, and the chin, throat, and lower neck all round with purple; the white spots on the scapulars are larger than in the allied species, whilst the spots on the flanks and upper tail-coverts are smaller. The most important distinction is to be found in the number of white streaks in front of the throat and on each side of the neck. Of the former there are six in *C. adamsi* and twelve in *C. glacialis*; whilst of the latter there are ten in *C. adamsi* and eighteen in *C. glacialis*. It is a slightly larger bird than the Great Northern Diver, having on an average a decidedly larger bill, measuring from the frontal feathers to the tip from $3\frac{1}{2}$ to $3\frac{3}{4}$ inches, that of the Great Northern Diver only measuring from $2\frac{3}{4}$ to $3\frac{1}{2}$ inches. Compared with the bill of the Great Northern Diver, it appears to be slightly recurved, an effect produced by the straightness of the culmen, which in the Black-billed species is decidedly decurved. Legs and feet olive-brown; irides light hazel. In the changes of its plumage it resembles its ally.

COLYMBUS ARCTICUS.

BLACK-THROATED DIVER.

(Plate 35.)

Mergus gutture nigro, *Briss. Orn.* vi. p. 115 (1760).
Colymbus arcticus, *Linn. Syst. Nat.* i. p. 221 (1766); **et auctorum plurimorum—** *Temminck*, (*Naumann*), *Dresser*, *Saunders*, &c.
Colymbus ignotus, *Bechst. Naturg. Deutschl.* ii. p. 782 (1791).
Urinator arcticus (*Linn.*), *Cuv. Anat. Comp.* i. table 2 (1799).
Colymbus leucopus, *Bechst. Orn. Taschenb.* ii. p. 364 (1803).
Eudytes arcticus (*Linn.*), *Illiger*, *Prodr.* p. 283 (1811).
Colymbus macrorhynchos, *Brehm*, *Vög. Deutschl.* p. 974 (1831).
Colymbus balticus, *Hornsch. & Schill. Verz. Vög. Pomm.* p. 21 (1837).
Colymbus atrigularis, *Homeyer*, *Vög. Pomm.* p. 79 (1837).

The Black-throated Diver breeds somewhat sparingly and locally in the lochs of the Outer Hebrides, and in the counties of Argyll, Perth, Inverness, Ross, and Sutherland. Elsewhere in the British Islands it can only be regarded as a somewhat rare and accidental visitor in autumn or winter. It is very rare on the south coast of England, but becomes more frequent in its appearance on the shores of the eastern counties from Yorkshire northwards. It is only known as a very rare straggler to Ireland, Thompson recording only two instances of its occurrence; but several other examples, of which the latest record is that of Mr. Lloyd Patterson, who watched one for some time near Belfast last April, have been observed in recent years. It sometimes wanders to inland sheets of water.

The Black-throated Diver appears to be a Siberian species which has not yet succeeded in becoming quite circumpolar. In the west it is unknown in the Faroe Islands and Iceland, and in the east, although it has crossed Behring Straits into North America, it is not known with certainty to breed further east than Melville Peninsula, though it may possibly do so in some of the fjords on the west coast of Greenland. Roughly speaking, its breeding-range may be said to be a belt, about a thousand miles broad, reaching three quarters of the way round the world. The Arctic circle divides this belt almost in the middle, except that in Western Europe, probably owing to the cooler summers, it breeds as far south as the Baltic provinces, Pomerania, South Scandinavia, and Scotland; and in Eastern Asia on the peninsula of Kamtschatka, from the same cause. A fish-eater like the Black-throated Diver can only be

found on open water in winter, consequently the East-Asiatic birds pass through Dauria and the valley of the Amoor on migration to winter in the Japanese seas, whilst the West-Asiatic and North-Russian birds migrate across country to the Black Sea and occasionally wander to the Caspian and Mediterranean Seas. It is distributed in winter throughout the coasts of Western Europe from the North Cape to Portugal, occasionally migrating across country to the Italian lakes and the Mediterranean. The Black-throated Divers breeding in Alaska and the valley of the Mackenzie River vary considerably, some of them having a shorter and more slender bill and a paler crown, nape, and hind neck. The latter are regarded as specifically distinct by Baird, Brewer, and Ridgway, but there can be little doubt that they intergrade and should bear the name of *Colymbus arcticus pacificus* *. This somewhat anomalous fact may be explained by supposing that during one of the later glacial periods the American Black-throated Divers were isolated and in course of time became slightly differentiated; but when the areas of distribution again became united by the passing away of the glacial period, we may suppose that the Black-throated Divers of the Old World again crossed Behring Straits and re-inhabited Alaska and the valley of the Mackenzie River, so that now both forms are found in this district. The Pacific form of the Black-throated Diver has occurred in winter as far north as the extremity of Lower California; the typical form winters in Behring Sea; two examples have been obtained on Lake Michigan, and one in the Bay of Fundy.

The Black-throated Diver differs in a few particulars of its habits from its large ally. It is not quite so exclusively oceanic in the selection of its winter-quarters, occasionally visiting inland lakes; and in the breeding-season it is found at a much greater distance from the ocean, occasionally migrating across country for a thousand miles or more. It arrives in the Arctic regions as soon as the ice breaks up, which on the Arctic circle in Siberia takes place about the 1st of June, but it passes through the Baltic provinces in considerable numbers during the first half of May. It leaves the tundras of the north about the middle of September, and passes through the Baltic provinces on its return journey about a month later. On the ground its motions are quite as awkward as those of its allies; it is unable to stand upright, and pushes itself along with its belly touching the surface; but its flight is even more rapid, and its powers of diving almost as

* The synonymy of the pale-naped form is as follows:—

Colymbus pacificus, *Lawr. Baird, B. N. Amer.* p. 889 (1858).
Colymbus arcticus, *var.* pacificus (*Lawr.*), *Coues, Key N.-Amer. B.* p. 335 (1872).
Urinator pacificus (*Lawr.*), *Stejn. Proc. U. S. Nat. Mus.* v. p. 43 (1882).
Colymbus arcticus pacificus (*Lawr.*), *Coues, Key N.-Amer. B.* 2nd ed. p. 791 (1884).

unrivalled. Its notes are quite as discordant, and both in the valleys of the Petchora and the Yenesay I have constantly heard its wild cries, exactly like the screams of a child in great pain, amidst the crash of the breaking ice-floes and the crisp rustle of the quick-marching pack-ice, especially in the misty twilight when the sun must have been a little way below the northern horizon. It is almost exclusively a fish-eater, but is said also to feed on frogs, mollusks, and crustaceous animals of various kinds.

At the nest the Black-throated Diver is much more ready to take wing than its larger ally. When Harvie-Brown and I were encamped on the shores of the lagoon of the Petchora, we found a nest of this species containing one egg; both parents seemed very much disturbed at our presence, and flew repeatedly over our heads, giving us ample opportunity of identifying the species. We were far beyond the limit of forest-growth, on a gently undulating moor abounding in lakes large and small; some of them seemed to be almost dried up or choked up with coarse grasses, rushes, and sedge. We spent an hour or two wading round the open water in one of these choked-up lakes, which had become a swamp with open water in the middle. The morasses are perfectly accessible with long waterproof boots. Although it was the 25th of July we found a good and safe bottom, hard and level as a stone floor, a solid pavement of ice. Numerous Red-necked Phalaropes were swimming on the open water, and amongst the coarse vegetation close to it was the nest of the Black-throated Diver. A foundation had been made of roots and dead grass half turned to peat, raked up from the bottom of the swamp, and upon this was a lining of fresh green sedge. The nest was a floating structure supported by the surrounding aquatic vegetation, and was a couple of feet in diameter. On the shingly shores of the mountain tarns of the Outer Hebrides similar nests are made; but, as is also the case with the Great Northern Diver, if the banks of the lake or island be grassy, the bird merely treads a hollow in the moss not much more than a foot in diameter, sometimes laying her eggs on the bare ground, and sometimes placing a few pieces of fresh sedge under them. This is its usual habit, according to Harvie-Brown, Gray, Elwes, and others.

My son saw several nests of this species on North Uist last summer, and has furnished me with the following notes:—"On this island, which does not contain a tree, the Black-throated Diver retires to the mountain 'lochs' to breed, where it makes its nest on an islet in the middle of the 'loch.' I saw three nests, two containing two eggs each, and a third from which the gamekeeper had shortly before taken two eggs. In each case the islands were very small, only a few yards across, and thin shingly banks sloped gradually out of the water, and beyond the reach of the waves were covered with grass and coarse vegetation. The nests, in each case, were within half a yard of the water's edge on the bare shingle, and

were substantial structures, about a foot in diameter and two or three inches high. The foundation was composed of dock-stalks and roots, upon which was a lining of fresh green grass and herbs, the whole forming a *bonâ fide* nest as different as possible from the slovenly débris on which its Red-throated cousin lays its eggs. The gamekeeper assured me that the Black-throated Diver always makes a substantial nest; but this statement does not agree with the observations of many ornithologists."

Two is the usual number of eggs, but sometimes one only is laid. The ground-colour is dark or light russet-brown, sometimes with a slight shade of olive. The spots are nearly black, sparingly distributed over the surface, rather more profusely at the larger end, and seldom as big as a pea. The underlying spots are few and indistinct. The eggs vary in length from 3·5 to 2·9 inch, and in breadth from 2·2 to 1·9 inch. It is very important that eggs of this bird should be carefully identified, as large examples cannot be distinguished from small eggs of the Great Northern Diver, nor small examples from large eggs of the Red-throated Diver.

The Black-throated Diver cannot be regarded as a gregarious bird, though it migrates in flocks. In the breeding-season two or three pairs sometimes breed on the same lake, but they associate very little, and in winter the adults are for the most part solitary, though the immature birds frequently flock together. They are difficult birds to shoot, diving at the flash, and when alarmed having the power of sinking in the water, so that often only the head and neck are visible; they are able to do this, in consequence of the backward position of their feet, as long as they continue in motion.

There is no difference in colour between the sexes of this species. In nuptial plumage the forehead, nape, and hind neck are pale slate-grey; the general colour of the rest of the upper parts is black, faintly glossed with purple and green, with rows of large, nearly square, white spots on the scapulars; there is a similar pattern, on a smaller scale, on each side of the upper back, and smaller oval white spots on the median and greater wing-coverts; the chin and upper throat are purplish grey, which shades into the slate-grey of the crown on the sides of the head; the lower throat is black, glossed with purple, separated from the upper throat by a row of short, white streaks, and from the hind neck by rows of long, white stripes, which are continued on the sides of the lower neck, not quite meeting in the centre of the neck; the flanks are black, but the rest of the underparts, including the axillaries and under wing-coverts, are silky white. Bill black; legs and feet dark brown; irides crimson. After the autumn moult the general colour of the upper parts is an almost uniform blackish brown, and that of the underparts, except the flanks, but including the sides of the face below the eye, pure white. In young in first plumage all the small feathers of the upper parts and the flanks have broad pale slate-grey margins, and

the sides of the head and the chin and throat are suffused with brown. After the first spring moult the adult plumage is nearly assumed, except that the slate-grey on the head and hind neck is darker. Young in down are blackish brown on the upper parts, and greyish brown on the under-parts*.

* It may save the student some trouble to know that the so-called young Black-throated Diver obtained at Nagasaki on the 25th of December, described by Saunders (Yarr. Hist. Brit. B. iv. p. 111), is an adult in winter plumage, which has begun to assume nuptial plumage on some of the wing-coverts. It is a rather remarkable fact that adult Divers assume their nuptial plumage so very early; young in first plumage moult much later, seldom before March, probably because they seldom breed until their second spring.

COLYMBUS SEPTENTRIONALIS.

RED-THROATED DIVER.

(Plate 35.)

Mergus gutture rubro, *Briss. Orn.* vi. p. 111 (1760).
Colymbus septentrionalis, *Linn. Syst. Nat.* i. p. 220 (1766); **et auctorum plurimorum**—*Temminck*, (*Naumann*), *Dresser*, *Saunders*, &c.
Mergus septentrionalis (*Linn.*), *Tunst. Orn. Brit.* p. 3 (1771):
Colymbus stellatus, *Müll. Zool. Dan. Prodr.* p. 20 (1776).
Colymbus striatus, *Gmel. Syst. Nat.* i. p. 586 (1788).
Colymbus borealis, *Lath. Ind. Orn.* ii. p. 801 (1790).
Urinator septentrionalis (*Linn.*), *Cuv. Anat. Comp.* i. table 2 (1799).
Colymbus rufogularis, *Meyer*, *Taschenb.* ii. p. 453 (1810).
Eudytes septentrionalis (*Linn*), *Illiger*, *Prodr.* p. 283 (1811).
Colymbus lumme, *Brehm*, *Vög. Deutschl.* p. 978 (1831, *ex Gunner*).
Cepphus septentrionalis (*Linn.*), } *Pall. Zoogr. Rosso-Asiat.* ii. pp. 342, 344 (1826).
Cepphus stellatus (*Müll.*), }
Urinator lumme (*Brehm*), *Stejn. Proc. U.S. Nat. Mus.* v. p. 43 (1882).

The Red-throated Diver is the best-known species of the genus in the British Islands, breeding commonly on the Hebrides, in many parts of the west and north of Scotland, and in the Orkneys and Shetlands. During winter it is tolerably common round the British coasts, wandering as far as the south coast of England and the Channel Islands. It is only known as a winter visitor to Ireland, but a few pairs probably remain to breed in suitable districts.

The geographical distribution of the Red-throated Diver is somewhat similar to that of its Black-throated ally, but it is circumpolar. This Diver breeds both north and south of the Arctic circle like its ally, but on the American continent its range extends much further north, almost as far as land is known to exist. Unlike its ally it breeds in Greenland, Iceland, the Faroes, Spitzbergen, and Nova Zembla. On the European continent, although its breeding-range extends to Scotland and South Scandinavia, in Pomerania and the Baltic provinces it is only known as passing through on migration. Its winter range is also much more extensive than that of its ally. In Western Europe it is found throughout the coasts from the North Cape to Gibraltar. In the Mediterranean it winters as far south as the north coast of Africa and the delta of the Nile. It also winters in considerable numbers in the basins of the Black and Caspian Seas. It is unknown in Turkestan and India, but its winter range extends to Japan, China, and Formosa. On the American continent it winters on

the Pacific coast as far south as California, occasionally on the Great Lakes, and on the Atlantic coast as far south as the mouth of the Potomac.

The habits of the Red-throated Diver are so similar to those of its allies, that little need be said respecting them. It is perhaps the most gregarious of the Divers, being frequently found in small parties during winter; but in the breeding-season each pair has its own district, which it jealously guards from the intrusive visits of any other members of the species or even genus. A remarkable exception is to be found on the island of Tamsö, in the Porsanger fjord, beyond the North Cape in Norway. On the banks of a tarn in this island Collett found fifteen nests of the Red-throated Diver in half an hour. The probable explanation of this curious deviation from its ordinary habits is to be found in the fact that the tarn contained no fish. The island is strictly preserved as an Eider-Duck nursery, and the lessee pays an annual rent of three hundred pounds of Eider down. The Divers have discovered that it is a safe breeding-place, and use it as such only, feeding in the fjord, where possibly each pair may have their own special range. As no food is to be obtained in the tarn, which also is the great resort of Gulls, Grey-lag Geese, and Eider Ducks, there is no reason why the Divers should be jealous of each other.

Where the other Divers are found the times of migration and nidification of the Red-throated Diver are the same as theirs. In Iceland fresh eggs may be obtained from the end of May to the middle of June; but in the Taimur peninsula Middendorff did not find eggs until early in July. Collett found two eggs in each of the fifteen nests he found on Tamsö, but on the 3rd of July most of them were considerably incubated.

The Red-throated Diver very rarely makes a nest; the eggs are often laid on the bare turf, often in a depression on the grass or moss, but a scanty lining of weeds or sedge is frequently found. The eggs are somewhat more variable in colour than those of its allies, being more commonly of a brownish olive than of a russet-brown ground-colour; the spotting is also occasionally somewhat bolder. They vary in length from 3·1 to 2·5 inch, and in breadth from 1·9 to 1·7 inch. Large eggs of this species cannot be distinguished from small eggs of the Black-throated Diver.

In almost all respects the Red-throated Diver resembles its allies. Its ordinary call-note is an *ak, ak,* but at its breeding-grounds the same wild screams are heard as those produced by its congeners. Its food, mode of flight, shuffling walk, and marvellous skill in diving closely resemble those of the other Divers. Gätke observed the Red-throated Diver in exceptionally large numbers, "almost by the million," at the end of the year 1879 near Heligoland; they were migrating towards the north-east for several days.

Respecting the power which this and some other birds have of sinking in the water, my friend Mr. Lloyd Patterson writes to me as follows:—

"Last night I had an excellent opportunity of watching a Red-throated Diver gradually sinking its body in the water before diving. I saw by the kind of quick shaking motion of the bird's body that it was pulling itself down in the water by a rapid action of the feet, till very little more than the top of the back and the neck and head were visible, when it bent its head forward and shot below."

The Black-throated Diver is a smaller bird than the Great Northern Diver, and weighs about a third less. The female is similar in colour to the male, but is slightly smaller. In nuptial plumage the general colour of the upper parts is brownish black, faintly glossed with green, each feather having an obscure paler margin, and those of the nape, hind neck, and the sides of the lower neck broadly margined with white, and there are a few scattered white spots on the upper back, scapulars, and wing-coverts; the head and neck are slate-grey, spotted on the crown with black, and the centre of the lower throat is reddish chestnut; the rest of the underparts are silky white, streaked with dark grey on the flanks, axillaries, and under tail-coverts. Bill black; legs and feet greenish black; irides hazel. After the autumn moult the chin and throat are white, and the crown and hind neck are slate-grey, sprinkled with brown and white; the rest of the upper parts, except the quills and tail-feathers, which are not moulted in the spring*, are greyish brown, spotted with white. Young in first plumage differ from autumn plumage of adults in having the white spots on the upper parts, especially on the scapulars and wing-coverts, elongated into streaks, and the ear-coverts, chin, and throat are mottled with brownish grey. After the first spring moult the adult plumage is assumed, except that the slate-grey of the head and neck is slightly suffused with brown, the chestnut on the throat is paler and duller in colour, and the white feathers on the lower throat, below the chestnut, have brown centres like those on the sides of the lower neck. Young in down have the upper parts brownish black, and the underparts greyish brown.

* Adamson ('Some more Scraps about Birds,' p. 199) asserts that the nearly plain back of the summer plumage of this species is acquired, not by a moult, but by the abrasion of the white spots. This is undoubtedly an error. The Red-throated Diver is not exceptional in this respect. Examples obtained in the valley of the Yenesay early in June are in splendid plumage, and show little or no signs of abrasion.

Family PROCELLARIIDÆ, or PETRELS.

The Petrels are a well-defined group of birds which are probably not very nearly related to any other family, inasmuch as ornithologists cannot agree to which family they have the greatest affinity. Sclater regards them as nearest related to the Gulls, but distantly enough to form an order by themselves. Forbes split them into two families, which he associated with the Herons, Pelicans, and Birds of Prey. Gadow regards the Petrels as nearly allied to the Gulls, but not quite so near to them as the Auks are, the three groups being rather more remotely allied to the Plovers, which he regards as less modified descendants of the ancestors of these four families.

Although the Petrels are schizognathous in the arrangement of their palatal bones, and were associated by Huxley with the Gulls, the Divers, the Grebes, and the Auks, they were regarded by him as aberrant forms inclining towards the Pelecanidæ. Newton regards them as distinct from the Laridæ and their allies, so much so as to warrant their being placed in an order by themselves. The number of notches on the posterior margin of the sternum of the Petrels varies in different genera. In Nitzsch's 'Pterylography' it is stated that the tract-formation of the Skuas is elevated into the type of a group in the Petrels.

Petrels only moult once in the year. The young are born covered with down, but they remain in the nest until they can fly. It is not known whether the young in first plumage moult in their first autumn, when the annual moult of the adults takes place.

The Petrels are all web-footed birds, with the hind toe either very small or absent. They have long wings, short tails, and hooked bills, but their most important external character is their tubular nostrils.

They form a large family, containing about a hundred species, which are distributed over the ocean in all parts of the world, approaching the coasts only to breed.

The Petrels which visit our coasts belong to four different genera, which may be characterized as follows:—

Large birds, with wings $8\frac{1}{2}$ inch long or more: first primary longest.	PUFFINUS ..	Nasal tubes much less than half the length of the bill.
	FULMARUS.	
Small birds, with wings $6\frac{1}{2}$ inch long or less: second primary longest.	PROCELLARIA.	
	OCEANITES ..	Tarsus booted in front, much longer than middle toe and claw.

Genus PUFFINUS.

The Shearwaters were included with the Petrels by Linnæus in the genus *Procellaria*; but in 1760 Brisson established the genus *Puffinus* for their reception in his 'Ornithologia' (vi. p. 130). The Manx Shearwater (the *Procellaria puffinus* of Linnæus and the *Puffinus puffinus* of Brisson) is the type.

The species in this genus are large birds, the wings measuring from 14 to 8½ inches. The wings are long and pointed, the first primary being the longest; and the tail, which consists of twelve feathers, is short and rounded. The tarsus is reticulated all round, and is about the same length as the middle toe, but decidedly longer than the bill. The hind toe is almost obsolete. The bill is rather slender, and the nasal tubes are only a third or a fourth of its length.

This genus contains about a score species, and is almost cosmopolitan in its distribution; but the Shearwaters are exclusively oceanic species, only seen on the coast during the breeding-season, and rarely venturing into the arctic regions. Two species only are known to breed on the European coasts, one of which visits our shores for that purpose. Several other species accidentally occur in the British seas.

Few birds are more exclusively oceanic in their habits than the Shearwaters. They spend most of their time on the wing, but they swim with great ease, though they are rarely if ever seen to dive. They are very silent birds, but at their breeding-grounds utter soft and agreeable notes. They feed on fish and other marine products. They breed in holes, make scarcely any nest, and lay a single white egg, which has a peculiar smell.

The British species belonging to this genus may be distinguished as follows:—

- Lores and upper ear-coverts same colour as the crown.
  - Sooty Shearwater. — Underparts uniform brown.
  - Great Shearwater.
  - Manx Shearwater. — Wing 9½ inches or under.
  - Dusky Shearwater. — Wing 9½ inches or under.

PUFFINUS MAJOR.

GREAT SHEARWATER.

(Plate 56.)

Procellaria gravis, *O'Reilly, Greenl. and N.W. Passage*, p. 140 (1818).
Puffinus major, *Faber, Prodr. Isl. Orn.* p. 56 (1822); **et auctorum plurimorum—**
Bonaparte, Lawrence, Baird, Coues, Dresser, Saunders, &c.
Ardenna major (*Faber*), *Reich. Syst. Av.* pl. 14. fig. 770 (1844).
Procellaria major (*Faber*), *Schlegel, Mus. Pays-Bas, Procell.* p. 72 (1862).

The Great Shearwater was for many years confused with the Sooty Shearwater, Gould and other ornithologists maintaining that the two birds were merely light and dark varieties of one species, which they supposed to vary in the colour of the underparts, as the Fulmar and the Pomarine and Richardson's Skuas are known to do.

The Great Shearwater is a tolerably frequent visitor to the British coasts; and probably its preference for the open ocean is the cause of its comparative abundance in the extreme south-west of England. It is sometimes seen in large numbers off the Scilly Islands and the Cornish coasts, but elsewhere it is accidental and irregular in its appearance. Gray gives no record of this bird in Scotland; and on the east coast of England it is rare, but examples have been taken on the Yorkshire and Lincolnshire coasts. Only very few instances have been recorded of its occurrence in Ireland; but it doubtless occurs more frequently off the south and west coasts of that country than in any other part of our islands.

It seems probable that the Greater Shearwater is confined to South Greenland during the breeding-season, but the identification of the eggs obtained there is not very satisfactory. When the breeding-season is over, it is a very common bird in mid Atlantic, occasionally straying to Iceland, the Faroes, and the Norwegian coast, and still more rarely to the south-west European coasts. It is more abundant on the Atlantic coasts of the American continent, especially those of Newfoundland and Nova Scotia, and occasionally wanders as far as the Gulf of Mexico. A solitary example was obtained near Cape Horn; but its alleged occurrence in the Cape seas appears to be an error, the Sooty Shearwater being the species found in that region. An allied species, differing in having the under tail-coverts pure white, and in other more important particulars, breeds on the Azores and on various islands in the Mediterranean. It cannot be regarded as only a southern race of the Greater Shearwater, and must be considered specifically distinct under the name of *Puffinus kuhli*.

In the Pacific Ocean the Great Shearwater is represented by two allied species, both of which are about the same size and have the same pale edges to the feathers of the upper parts. *Puffinus leucomelas* occurs in the North Pacific on the Asiatic coasts, and differs in having the margins of the feathers of the back nearly white, the feathers of the head and hind neck also margined with white, and the white on the upper tail-coverts more developed. *P. creatopus* occurs within the tropics on the American coasts of the Pacific, and differs in having no white on the upper tail-coverts.

The Great Shearwater is a bird of the open ocean, wandering far and wide, sporting on rapid wings hither and thither in search of food, and dropping buoyantly on the water to sleep or rest. A bird of such habits has no cause to visit the land, except during the few months of the breeding-season, and as soon as the young are safely reared it is off to the ocean again. Beyond the peculiarities of its flight, and its attendance upon ocean-going vessels, little has been recorded of the habits of the Great Shearwater, and nothing is known of its life-history during the breeding-season.

In crossing the Atlantic in autumn the Great Shearwater is much more local than either the Fulmar or Wilson's Petrel. I have occasionally seen them approach very near the ship, but they never seemed to take any notice of it, nor did they follow in the ship's wake or stoop to pick up any thing that might be thrown out to attract them. Sometimes half a dozen may be seen together, but more often they are in pairs. Compared with the Fulmars they look very black, but as they turn so that the sun shines upon them they look brown against the blue waves. Their underparts look almost white; but as they skim up from the waves, the brown edges of the under wing-coverts can easily be seen. The white on the upper tail-coverts is conspicuous during flight, and the neck is shortened so as to produce the appearance of a white streak behind the ear-coverts. It is impossible to ascertain during flight whether the under tail-coverts be white or not, as they are always covered by the outstretched feet. The Great Shearwater has even greater power on the wing than the Fulmar; he flies with the wings more bent, and seems to follow the surface of the waves still closer; he really does "shear" the "water," only now and then rising with Swallow-like flight above the horizon. He skims along the surface of the Atlantic billows with almost motionless wings, turning suddenly to avoid a breaker or to follow some object floating on the water which has caught his eye, and which he sometimes snatches up without apparently lessening his speed. Wind or rain do not appear to incommode him in the least, he never seems tired. He is very rarely seen to alight on the surface of the water; he sometimes remains in sight for an hour together, but more often he passes on, and frequently not a Shearwater is visible during the whole day.

Upon the land it is said to walk with as much ease as a Duck; and when caught or alarmed to vomit a quantity of oil from its bill. Its food is principally composed of small cuttlefish, and Audubon found in the stomachs of birds he dissected portions of fish, crabs, seaweeds, and oily substances. Nothing is known of the nidification of the Great Shearwater, but it probably does not differ in any important respect from the Manx Shearwater. Eggs, said to be of this species, from Greenland are described by Baird, Brewer, and Ridgway as white, and varying in length from 2·88 to 2·75 inch, and in breadth from 2·0 to 1·85 inch. The Great Shearwater sometimes accompanies the whalers and the fishing-boats, to pick up any offal or scraps of blubber that may chance to be thrown overboard. It is a voracious feeder, and is often captured by means of a baited hook. Flocks of this bird are met with at sea, sometimes composed of as many as a hundred birds, which often sit on the water until the ship closely approaches them, when they rise, not *en masse*, but one or two at a time, and fly forwards for some distance and again alight as before. Of the habits of the young after leaving the nest nothing appears to be known.

The Great Shearwater is about the same size as the Fulmar, but is somewhat slenderer in form. There is no difference in colour between the sexes. The adult after the autumn moult has the general colour of the upper parts dark brown, with a slight shade of slate-grey in newly-moulted birds. All the small feathers below the nape have broad pale brown margins, and the outermost upper tail-coverts are tipped with white; the demarcation between the dark upper parts and the white underparts forms an abrupt line from the gape across the upper ear-coverts; the sides of the breast, the flanks, the under tail-coverts, the centre of the belly, and the marginal under wing-coverts are varied with brown; otherwise the whole of the underparts are pure white. Bill brownish black; legs and feet olive, paler on the webs; irides dark hazel. In summer all trace of slate-grey on the upper parts fades into rusty brown. Young in first plumage are not known to differ in any respect from adult birds. An example in Hargitt's collection is moulting its primaries and some of the feathers of the upper parts, and is dated "Greenland, June 28th."

PUFFINUS ANGLORUM.

MANX SHEARWATER.

(Plate 56.)

Puffinus puffinus, *Briss. Orn.* vi. p. 131 (1760).
Procellaria puffinus, *Linn. Syst. Nat.* i. p. 213 (1766).
Procellaria puphinus, *Tunst. Orn. Brit.* p. 4 (1771).
Procellaria anglorum, *Temm. Man. d'Orn.* ii. p. 807 (1820); **et auctorum plurimorum**—(*Audubon*), (*Baird*), (*Dresser*), (*Saunders*), &c.
Puffinus anglorum (*Temm.*), *Boie, Isis*, 1822, p. 562.
Puffinus arcticus, *Faber, Prodr. Isl. Orn.* ii. p. 56 (1822).
Procellaria yelkouan, *Acerbi, Bibl. Ital.* cxl. p. 294 (1827).
Thalassidroma anglorum (*Temm.*), *Swainson, Classif. B.* ii. p. 374 (1837).
Nectris puffinus (*Briss.*), *Keys. & Blas. Wirb. Eur.* p. xciv (1840).
Cymotomus anglorum (*Temm.*), *Macgill. Man. Orn.* ii. p. 13 (1842).
Puffinus yelkouan (*Acerbi*), *Bonap. Consp.* ii. p. 205 (1857).
Nectris anglorum (*Temm.*), *Rey. Synonymik Eur. Brutv.* p. 150 (1872).

The Manx Shearwater is *par excellence* the Shearwater of the British Islands, where it is widely distributed, breeding in many localities. It is said to breed on several islands off the Devonshire coast in the British Channel, and certainly does so in the Scilly Islands and in many places in the islands off the west coast of Scotland, especially on Soay, one of the St. Kilda group, and on the Orkneys and Shetlands. It formerly bred on the Calf of Man, and many of its alleged breeding-places in Scotland are now known to be deserted. Its breeding-range in Ireland has not yet been fully investigated, but it is known to nest on Rathlin Island, as well as in some few stations off the Kerry Coast and in St. George's Channel. It is not known to breed anywhere on the east coast of England or Scotland; but in autumn and winter it wanders far from home, and is then seen more or less commonly on almost every part of the British coasts, including the Channel Islands.

The Manx Shearwater is exclusively an Atlantic species, breeding only on the European coasts. Its principal colonies are on Iceland, the Faroes, St. Kilda, the islands off the coast of Brittany, the Azores, various islands in the Mediterranean as far east as the Bosphorus, Madeira, and the Canaries. During winter it is found on most coasts of Western Europe, and is a rare straggler to the coasts of South Greenland, Newfoundland, Nova Scotia, and the United States as far south as New York.

By some ornithologists the Manx Shearwaters breeding in the Mediterranean are supposed to be specifically distinct from the Atlantic species; they are said to have brown instead of white axillaries and under tail-

coverts, and have been named *Puffinus yelkouan*. There does not, however, seem to be any evidence that these forms are even subspecifically distinct; both of them, as well as intermediate examples, occur in the Mediterranean and on the coasts of our islands. The light and dark forms of this species, if such they can be called, like those of the Fulmars and the Skuas, do not appear to be geographically distinct.

The Manx Shearwater appears to be an Arctic form of the tropical Shearwater (*Puffinus obscurus*), inaptly named the Dusky Shearwater, but is represented in the Pacific by a still closer ally, the Black-vented Shearwater (*P. opisthomelas*); but the specific distinctness of the three forms is generally admitted. The Manx Shearwater may be distinguished from the former by its larger size (wing $8\frac{1}{2}$ inches or more), and by the white of the underparts not extending up to the eye and on the lores, and from the latter by its white orbits.

The Manx Shearwater is the best-known species of its kind to be met with in the British seas. Like the other species of Shearwater it spends most of its time far out at sea, dashing quickly over the water in erratic course, following the curves of the waves, now high up flitting bat-like over a green sea, now deep down in the trough. In many of its actions it puts one in mind of a gigantic Swift, its long narrow wings sometimes seeming to be moved alternately. Sometimes it is seen to hover above an object floating on the sea, letting down its legs and beating the water with its feet. In summer the Manx Shearwater is almost entirely nocturnal in its habits, remaining close in its hole during the daytime, but in winter it may be seen abroad at all hours. It often alights on the sea, where it swims with ease, sitting rather low in the water. It may be noticed abroad even in the most stormy weather, and like the Petrels seems to take a delight in wildly careering too and fro over the dark waves when the gale is at its height. The food of the Manx Shearwater is probably chiefly composed of small cuttlefish, mollusks, and scraps of offal found floating on the sea; it also eats great quantities of sorrel, and the remains of seaweed have been found in its stomach.

Dixon made the following notes on this species during his visit to St. Kilda in June last year:—"The Manx Shearwater, or 'Scrapire,' as it is locally termed, is one of the commonest birds of St. Kilda. Its great stronghold is on the island of Soay, but many pairs breed on St. Kilda and a few also on Doon. Unfortunately I was unable to land on Soay, owing to the tremendous swell which was breaking over it. The landing-place on this rocky islet is on the extreme south-eastern portion, where the narrow strip of sea separates it from St. Kilda. In this narrow strait are situated several 'stacks' of rock, which afford abundant accommodation for thousands of birds. At all times the landing on this outlying island is difficult, if not dangerous, as the island

is so steep and rugged. Donald Macqueen supplied me with much information about this island and the Shearwaters that use it for a nursery. He told me that the bird is so common there that he has known a boat's crew (of which he was a member), despatched to the island to collect birds and eggs, capture as many as four hundred Shearwaters in a single night, and that their cries were almost deafening; he also said that it is one of the earliest birds to arrive at the islands in spring, coming as early as February, and that it is one of the last to leave in autumn. I found the Manx Shearwater nocturnal in its habits, like the Petrels, and at night-time it becomes very garrulous. Donald imitates its cry to a nicety, which may be expressed on paper as *kitty-coo-roo, kitty-coo-roo.* This note is uttered both when the bird is on the wing and when sitting on its nest. Guided by the note the islanders are able to find the nests with little difficulty, so that they always prefer to go in search of this species at night. Dogs are also trained for the purpose of finding the holes. Donald was well aware how anxious I was to obtain the eggs of this species, and on the 11th of June he went off on a private expedition of his own to try and obtain them for me. He returned in the afternoon in triumph, bringing with him a couple of birds and their eggs. Both birds were females. One of the eggs was quite fresh, but the other was so highly incubated that I could not blow it. The next day I accompanied Donald to the cliffs to see the place and search for others. We climbed the hills behind the village, skirted the glen beyond them, and found ourselves on the summit of the cliffs on the south-west side of St. Kilda. The sea was roaring and seething at their base like a huge caldron, the spray dashing in clouds over the rocks. A few Fulmars were to be seen here and there upon their eggs, Guillemots, Razorbills, and Puffins were in considerable numbers, and Kittiwakes and Great Black-backed Gulls now and then flew along the face of the cliff. Barefoot we climbed down the rocks to within a few hundred feet of the sea, and finally arrived at the place where Donald made his captures the day before. The eggs were obtained in a steep grassy part of the cliff, where a foothold could only be obtained with difficulty, and where the least false step would hurl the unfortunate climber into the angry sea below. The Shearwater burrows in the ground like a Puffin or a Petrel, and the holes are sometimes very long and often under large masses of rock, where it is impossible to reach the nest. The holes from which Donald took the eggs were about four or five feet in length, and the nest was merely a little bunch of dry grass. At the mouth of most of the holes there was a considerable amount of the birds' droppings. We found another egg, but no bird was sitting upon it. Soon afterwards Donald 'spotted' another likely hole, and after half an hour's digging we finally caught a pair of birds; the hole contained no nest nor egg, and it was evident the birds had only come into it to spend the day. The

Shearwaters I dissected had been feeding on sorrel, and the stomachs contained a large quantity of dark oily matter, much darker than that found in the Fulmars. Both birds assist in making the burrows, and the holes vary a good deal in depth and in straightness."

There are several breeding-places of this bird in the Mediterranean. I am indebted to Capt. Beecher for an interesting account of his visit to the island of Fifla, a limestone rock about two and a half miles south-west of Malta, where a small colony of Manx Shearwaters were breeding at the base of the cliff, amongst a pile of blocks of stone of all sizes. A favourite situation was behind the vegetation which covered the face of the overhanging rock. Other nests were in the hollows formed by the fallen débris. There was seldom any nest, rarely even a slight hollow, but occasionally the egg was placed upon a few dry stalks. Two birds which he caught on the eggs proved to be males, and in many of the holes both parents were found. One or other of the birds always remains to guard the egg from the attacks of a black lizard. Eggs taken on the 5th of April were slightly incubated, those on the 12th of April much more so.

The Manx Shearwater breeds in similar situations on the small islands round the coast of Corsica (Whitehead, 'Ibis,' 1885, p. 48), the egg being "placed under piles of large rocks which had fallen from the cliff above, only a few feet from high-water mark." Another breeding-place is the Cyclades (Krüper, Journ. Orn. 1863, p. 234), where they breed in an almost precisely similar situation.

The Manx Shearwater only lays one egg, which is much smoother in texture and more glossy than that of the Fulmar, and pure white in colour, and varies in length from 2·5 to 2·3 inch, and in breadth from 1·75 to 1·55 inch.

The eggs are laid in St. Kilda early in May, and fresh ones may be obtained from that date onwards till the middle of June. If the first egg be taken it is said that the female will lay another in the course of a few weeks, either in the same hole or in another made close to it. Both birds assist in the duties of incubation, and the young remain in the nest till able to fly. From the oily nature of their food the young birds become excessively fat, and are then prized by the natives as articles of food. Except during the breeding-season, the Manx Shearwater is rarely observed on the land. It wanders far and wide over the surface of the ocean, straying in winter far from its accustomed summer haunts, picking up its food from the waves, and resting, and even sleeping, on the sea.

One of the most interesting sights in the Levant and on the Bosphorus is to watch the long strings of Shearwaters flying to and fro between their breeding-places and their feeding-grounds. There are two species, a large and a small one. The large one, which is about the size of the Great Shearwater, is the Mediterranean Shearwater (*Puffinus kuhli*) : the smaller

species is the Manx Shearwater. They fly close to the surface of the water, in an almost perfectly straight line, one behind the other, and at an incredible speed; every muscle seems to be strained; they hurry along as if the furies were behind them, and have acquired amongst the Levantines the sobriquet of "âmes damnées."

There is no difference in colour between the sexes of the Manx Shearwater, but the female is slightly smaller. After the autumn moult adult birds have the general colour of the upper parts black, with a slight tinge of slate-grey, especially on the margins of the feathers. The dark feathers extend on the lores and the upper half of the ear-coverts, slightly encroaching on the sides of the breast, the thighs, and the sides of the under tail-coverts; there is a dark subterminal band across the axillaries; the remainder of the underparts are pure white. Bill greenish black; legs and feet brown, varied with dull orange; irides hazel. In late summer the colour of the upper parts fades into brown. Young in first plumage do not differ in any respect from adults. Two examples in Hargitt's collection, obtained by Mr. H. C. Müller on the Faroes on the 27th and 30th of August (one half down and half feathers, the other slightly further advanced), precisely resemble adults. Young in down are nearly uniform greyish brown, slightly paler on the throat and breast.

PUFFINUS OBSCURUS.

DUSKY SHEARWATER.

(Plate 56.)

Procellaria obscura, *Gmel. Syst. Nat.* i. p. 559 (1788); **et auctorum plurimorum—** (*Bonaparte*), (*Audubon*), (*Baird*), (*Saunders*), &c.
Nectris obscura (*Gmel.*), *Keys. & Blas. Wirb. Eur.* p. xciv (1840).
Puffinus obscurus (*Gmel.*), *Reich. Schwimmvög.* pl. vi. figs. 2250, 2251 (1848).
Puffinus auduboni, *Finsch, Proc. Zool. Soc.* 1872, p. 111.

It is very unfortunate that this species should have received the English name of Dusky Shearwater, a most inappropriate appellation, which has caused some ornithologists to confuse it with the Sooty Shearwater. Its pure white underparts show at once its much closer affinity to the Manx Shearwater than to the Sooty Shearwater, in which the underparts are brown like the back.

Two instances of the capture of the Dusky Shearwater in our islands entitle it to a place in the British list. A bird of such wandering habits, roaming over thousands of miles of ocean, has probably visited our shores more frequently, but has escaped notice. The first example was sent to Yarrell by Mr. Blackburn, of Valentia Harbour, who stated that it had flown on board a small vessel off the island of Valentia, on the south-west coast of Ireland, on the 11th of May, 1853 (Yarrell, Zool. 1853, p. 3947). The second British example was found dead by a gamekeeper about the 10th of April 1858, on the Earsham estate, within a mile of Bungay in Suffolk (Stevenson, Zool. 1858, p. 6096): the specimen was lost sight of for some years, but was afterwards traced, thoroughly identified, and exhibited at a meeting of the Zoological Society of London (Stevenson, Proc. Zool. Soc. 1882, p. 421).

The Dusky Shearwater is a tropical species, breeding both in the Atlantic and the Pacific, represented in the Southern Seas by a smaller race, *Puffinus assimilis* (measuring only $6\frac{1}{2}$ inches in length of wing), which may possibly be only subspecifically distinct. In the Northern Seas it is represented by two more distantly allied species, which are slightly larger, and also differ from both the above species in having the brown on the head extending below the eye to the lores and ear-coverts. Of these the Manx Shearwater (*P. anglorum*) is an Atlantic species, and the Black-vented Shearwater (*P. opisthomelas*) is a Pacific species.

The Dusky Shearwater has not yet been recorded from the Indian Ocean. In the North Atlantic it breeds in the Bahamas, the Bermudas, and in many of the islands off the coast of West Africa. In the Pacific it has

been obtained on the Galapagos Islands, some of the Pacific islands, and on the coasts of New Zealand and Australia. When the breeding-season is over, these birds wander far and wide over the surface of the ocean, and it is quite probable that they may occasionally round the Cape of Good Hope or Cape Horn, so that their winter area of distribution may be regarded as continuous. With the exception of the examples obtained off the British coast, the Dusky Shearwater is not known to have occurred in Europe; but on the American coast it has been obtained as far north as New York.

The Dusky Shearwater is said to breed, in company with its near ally the Manx Shearwater, on the Azores and the Canaries, and its eggs have been obtained on the Desertas, a group of islands near Madeira. It resembles the latter bird in all its habits. Its note resembles that of its ally, and has been expressed as *pemlyco*. It breeds in the same way, and lays a single pure white egg, which varies in length from 2·3 to 2·0 inch and in breadth from 1·45 to 1·3 inch.

The Dusky Shearwater only differs from the Manx Shearwater in being slightly smaller in size (wing 8 inches or under) and in having the white of the underparts extending on the lores and over the entire ear-coverts up to and behind the eyes. It is not known that there is any difference in the changes of plumage which the two species undergo.

The Dusky Shearwater, like some of its congeners, appears to vary in the colour of its under tail-coverts from white to brown; and Baird, Brewer, and Ridgway have separated the two forms under the impression that the whiter examples were confined to the Pacific; but as the collection of Salvin and Godman contains examples of both forms from the Pacific, it seems probable that there is no geographical distinction between them.

PUFFINUS GRISEUS.

SOOTY SHEARWATER.

Procellaria grisea, *Gmel. Syst. Nat.* i. p. 564 (1788); **et auctorum plurimorum**—(*Finsch*), (*Salvin*), (*Baird, Brewer, & Ridgway*), (*Saunders*), &c.
Procellaria tristis, *Licht. Descr. An. Coll. J. R. Forst.* p. 205 (1844).
Nectris fuliginosus, *a.* chilensis, *Bonap. Consp.* ii. p. 202 (1857).
Puffinus tristis (*Licht.*), *Gray, Ibis*, 1862, p. 244.
Nectris amaurosoma, *Coues, Proc. Ac. Nat. Sci. Philad.* 1864, p. 124.
Puffinus amaurosoma (*Coues*), *Gray, Hand-l. B.* iii. p. 102 (1871).
Puffinus griseus (*Gmel.*), *Finsch, Journ. Orn.* 1874, p. 209.
Puffinus stricklandi, *Baird, Brewer, & Ridgway, Water-Birds N. Amer.* ii. p. 390 (1884).
Puffinus fuliginosus (*Kuhl*), *apud Strickland*, (*Keyserling & Blasius*), &c.

The first recorded example of the Sooty Shearwater in the British Islands was shot by Mr. George Marwood, Jun., at the mouth of the Tees, in the middle of August 1828. It was exhibited at a meeting of the Zoological Society of London by Mr. Arthur Strickland, who communicated the particulars of its capture (Proc. Zool. Soc. 1832, p. 129). Since that date so many examples have been obtained that a detailed notice of their capture is unnecessary. Yorkshire heads the list with nine, Northumberland and Devon with two each; and Norfolk, Cornwall, and Dorset each furnish an example. Saxby and Gray state that this Shearwater has been captured in the Shetlands and off Caithness, but the identification of the species is not quite conclusive. An example shot off North Berwick is referred to this species by Mr. J. Dalgleish. In Ireland this bird is of only accidental occurrence. It is said to have been seen off Cork Harbour by Mr. R. Warren, one was shot off the coast of Kerry, and another, now in the possession of Mr. Lloyd Patterson, was shot in Belfast Lough. All these examples, where a date is given, were taken in autumn.

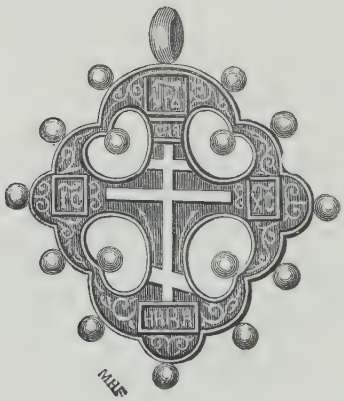
The only known breeding-place of the Sooty Shearwater is on the Chatham Islands east of New Zealand, but there can be little doubt that many other nesting-places of this species remain to be discovered both in the Atlantic and the Pacific. In the former ocean it has been obtained in the Bay of Fundy, off the coasts of Newfoundland, Labrador, and Greenland, on the Faroes, the coasts of the British Islands and those of Northern France, and as far south as the Cape seas. In the latter ocean it has been found on the east coast of Australia, the shores of New Zealand, the coast of Chili, and off the southern promontory of California.

The Sooty Shearwater is not known to differ in its habits from its allies. Its egg is unknown, as it is impossible to accept Buller's statement that it

measures 3·25 by 2·0 inch ($2\frac{1}{2}$ by $1\frac{3}{4}$ is more probable). On the Chatham Islands it is said (Travers, Trans. N. Zealand Inst. v. p. 220) to be common all round the coasts, and to burrow in peaty ground, forming a rude nest of twigs and dead leaves at the extremity of the hole. "The old birds roost on shore, the noise they make during the whole night being absolutely frightful."

The Sooty Shearwater is intermediate in size between the Great Shearwater and the Manx Shearwater. There is no difference in the colour of the sexes of this species. After the autumn moult the adult bird has the general colour of the upper parts blackish brown, most of the small feathers having slightly paler margins. The general colour of the underparts is an almost uniform greyish brown, darkest on the flanks, palest on the chin and throat, but the under wing-coverts are white, with dark shafts, and are slightly mottled with brown. Bill dark brown; legs and feet brown, paler on the webs; irides dark hazel. Young in first plumage appear to be absolutely unknown.

Baird, Brewer, and Ridgway regard the Atlantic Sooty Shearwaters as specifically distinct from those from the Pacific under the name of *Puffinus stricklandi*. Examples of the latter in the collection of Salvin and Godman do not appear to differ from a British-killed example in the same collection, so that it seems premature to recognize even a subspecific difference between them.



Genus FULMARUS.

The Fulmars were included both by Brisson and Linnæus in the genus *Procellaria*, but in 1826 Stephens, in Shaw's 'General Zoology' (xiii. pt. 1, p. 230), established for their reception the genus *Fulmarus*, a name suggested to him by Leach.

The Fulmar Petrel, *Fulmarus glacialis*, has by common consent been accepted as the type.

The Fulmars are large birds, the wings being a foot long and pointed, having the first primary the longest. The tail is short and rounded; the tarsus is reticulated all round, shorter than the middle toe, but longer than the bill; the hind toe is very small; the bill in the only British species is very stout, and the nasal tubes extend along the basal half, joining the maxillary margin which forms the terminal half.

The genus may be regarded as cosmopolitan, but its limits are not yet accurately defined.

The Fulmars are exclusively oceanic in their habits. They fly and swim with the greatest ease, but do not dive. They are remarkably silent birds. They feed on fish and other marine animals. They breed in holes, make little or no nest, and lay a single white egg, which has the peculiar Petrel smell.

FULMARUS GLACIALIS.

FULMAR PETREL.

(Plate 56.)

Procellaria cinerea, *Briss. Orn.* vi. p. 143 (1760).
Procellaria glacialis, *Linn. Syst. Nat.* i. p. 213 (1766); **et auctorum plurimorum** —*Gmelin, Latham, Temminck,* (*Dresser*), (*Saunders*), &c.
Procellaria grönlandica, *Gunner, Leem. Beskr. Finm. Lapp.* p. 273 (1767).
Fulmarus glacialis (*Linn.*), *Steph. Shaw's Gen. Zool.* xiii. pt. 1, p. 234, pl. 27 (1825).
Rhantistes glacialis (*Linn.*), *Kaup, Natürl. Syst.* p. 105 (1829).
Procellaria hiemalis, *Brehm, Vög. Deutschl.* p. 800 (1831).
Procellaria minor, *Kjærb. Danm. Fugle,* p. 324 (1852).
Fulmarus minor (*Kjærb.*), *Bonap. Consp.* ii. p. 187 (1857).

The only regular breeding-place of the Fulmar in the British Islands is on St. Kilda and the adjoining islets and stacks—a group of rocky islands about forty miles west of the Hebrides. One or two solitary pairs are said to breed on the west coast of Skye, and others are said to have done so half a century ago in several localities on the west coast of Scotland. In winter the Fulmar is a somewhat rare straggler to the British coasts, and, curiously enough, has been seen far less frequently off the Irish coast than elsewhere.

The Fulmar is a circumpolar bird, entirely confined to the northern hemisphere. Its breeding-colonies are somewhat isolated, but its geographical distribution appears to be continuous, being apparently only interrupted in Northern Asia. The probable reason why it does not visit the Arctic shores of Siberia is that they are only free from ice in August, when it is busily engaged in feeding its young. In the North Pacific its principal breeding-places are on the Kurile Islands, south of Kamtschatka, the Pribylov Islands in Behring Sea, and Copper Island, between the Sandwich Islands and California. In the Arctic Ocean, halfway to the Atlantic, there is a colony on Prince Albert Land, and examples have been known to wander as far north as Grinnell Land. There are enormous colonies on both sides of Davis Strait, Iceland, St. Kilda, the Faroes, Spitzbergen, Bear Island, and Nova Zembla. In winter its range in the Atlantic appears to be about as far south as New York in the west, and the Medi-

terranean Sea in the east. On the Asiatic shores of the Pacific it wanders as far south as Japan; but how far south the Fulmars breeding on Copper Island range appears to be unknown.

The Pacific Island colonies of the Fulmar are possibly isolated from those in the Atlantic, but birds from Prince Albert Land may mix with both. This comparative isolation has given rise to great variety both in size and colour, but many colonies consist of both large and small, and dark and light birds. On an average, birds from the Pacific Ocean are darker in colour than those from the Atlantic, but the bill is lighter. The Pacific Fulmars of the Kurile and Pribylov Islands also differ in some respects from those breeding on Copper Island, but the points of distinction have not been satisfactorily determined. If they be regarded as subspecifically distinct from the Atlantic Fulmars, the former must bear the name of *Fulmarus glacialis rodgersi*, and the latter that of *F. glacialis glupischa*; but it is quite possible that when a large enough series has been compared it may be found that there is only one species of Fulmar, of which there is a dark and light form, as in the Pomarine and Richardson's Skuas, not differing in geographical distribution, and consequently not deserving of being regarded as subspecifically distinct.

No bird is more thoroughly oceanic in its habits than the Fulmar. It lives exclusively at sea, often at great distances from land, and only visits some isolated ocean rock to rear its young. It follows in the track of the whalers, even to the limit of open water, to feast upon the scraps of blubber and the oil floating on the sea. It is an almost constant attendant upon the deep-sea fishing-boats, to prey upon the offal that is cast overboard, and is often so eager in its search for food as to allow itself to be caught by the hand. Large pieces of food are eaten whilst the bird sits lightly on the water and tears them to pieces with its strong hook-shaped bill; but small morsels are either eaten at once or carried off to some distance, where they can be quietly devoured. The food of the Fulmar is largely composed of mollusks, cuttle-fish, and any garbage that it may find floating on the water, especially such that is of an oily nature. It also eats large quantities of sorrel; and the blubber of the whale is eagerly sought after.

The Fulmar has great power of wing; it flies in a very similar manner to a Gull, and is generally mistaken for one of those birds, which it also closely resembles in the colour of its plumage. Parties of ten to twenty birds may often be seen following in the wake of the Atlantic steamers to pick up any food that may be thrown overboard from time to time. They never seem to tire, but fly backwards and forwards, crossing and recrossing the ship's stern, and often settling down one by one on the surface of the water to feed on anything eatable that they may descry floating on the

waves. If a piece of meat be thrown to them they often seize it before it sinks, but instead of diving after it as a Duck or a Guillemot would do, they alight on the surface feet first, and in the most comical way let themselves sink down in the water with uplifted wings. They are rather stupid birds, and do not see half the food thrown out to them; but their power of continued flight is very marvellous. They follow a steamer going fifteen miles an hour against a head-wind of still greater speed, with such ease that only an occasional flap of their wings is observable, and when the stern is reached they wheel gracefully round with the line of their long outstretched wings frequently brought for a moment at right angles to the surface of the water. In very wet weather they disappear; but half a gale of wind does not appear to interfere with their movements in the least, except that their wings are more actively employed, though even then they continually skim along with outspread motionless wings over the surface of the waves, bounding over their crests and descending into the hollows. It is not to be supposed that the same individuals follow the ship across the Atlantic; on some days the number is very few, on others greater, and generally at sunset every bird disappears.

Dixon made the following notes on this species during his visit to St. Kilda in June last year:—"In no part of its extensive range can the habits of the Fulmar be studied so easily or to better advantage than at St. Kilda and its adjoining isles. A visitor approaching these famous islands for the first time gazes at them with great disappointment if he be an ornithologist, for not a tithe of their bird riches is exposed to view; not a single Fulmar is to be seen, and the place seems almost destitute of bird-life. The great stronghold of the Fulmar is out of sight behind the towering hills and crags that hem the small bay on three sides; and it is not until an ascent of them has been made that a glimpse of the bird can be obtained. In crossing the forty miles of Atlantic swell which separates St. Kilda from the Outer Hebrides a few stray Fulmars perhaps hover above the vessel or fly silently around, but that is the only evidence of the presence of the famous bird-bazaar ahead. The cliffs at St. Kilda are not by any means the terrible places I expected to find. Grand and stupendous I admit they are, but beyond the celebrated 'stacks' (masses of rock rising almost abruptly from the ocean) there are comparatively few cliffs that a tolerable climber could not explore unaided by a rope. Most of the cliffs are broken, and all are more or less studded with grassy slopes, on most of which sheep graze in comparative safety. In many places, although the cliff is very precipitous, it is covered with grass, sorrel, and other plants, and a loose rich soil. It is in such spots that the Fulmar breeds in the greatest numbers. I shall never forget the imposing effect of this noble bird-nursery. Just before I reached one of the shoulders of

Connacher, a few Fulmars were to be seen sailing in graceful flight above the cliff, then dropping down again into space. When I reached the summit the scene was grand; tens of thousands of Fulmars were flying silently about in all directions, but never by any chance soaring over the land; they passed backwards and forwards along the face of the cliff and for some considerable distance out to sea, whilst the waves a thousand feet below were dotted thickly with floating birds. The *silence* of such an animated scene impressed me: not a single Fulmar uttered a cry, but lower down the cliffs Kittiwakes were noisy enough. No bird flies more gracefully than the Fulmar; it seems to float in the air without any exertion, often passing to and fro for minutes together with no perceptible movement of its wings; and I repeatedly saw a bird, head to wind, quite motionless for several seconds, the stiff breeze ruffling a few of its scapulars and neck-feathers. It is a remarkably tame bird, fluttering along within a few feet of you, its black eye glistening sharply against its snow-white dress. Sometimes I saw it hover like a Kestrel, or turn round completely in the air, as if on a pivot. But the Fulmars in the air are soon left to themselves, and all attention directed to those sitting quietly on their nests. In some parts of the cliffs, where the soil is loose and turf-grown, the ground is almost white with sitting Fulmars. Every available spot is a Fulmar nest; and as you explore the cliffs, large numbers of birds fly out from all directions where they had not previously been noticed. The Fulmar begins to lay about the middle of May, and I was told that the young are able to fly in July. It very rarely burrows deep enough in the ground to conceal itself whilst incubating, and, in the majority of cases, only makes a hole large enough to half conceal itself, whilst in a great many instances it is content to lay its eggs under some projecting tuft, or even on the bare and exposed ledge of a cliff, in a similar place to that so often selected by the Guillemot. I imagine that the bird makes a small excavation wherever it can; but there are not suitable places for all, and great numbers have to breed in unfavourable positions. The nests are very slight, and in a great number of instances are dispensed with altogether. I found several eggs of the Fulmar on Doon in rather peculiar nests; they were placed on the rock-ledges in the most inaccessible part of this precipitous and rugged island, and were made entirely of small bits of rock, a neat hollow being formed in which the single egg was laid. A little dry grass was the only material I found the Fulmar use in making its nest, with the exception just alluded to. I took eggs from both descriptions of nest, and also from places where no nest whatever had been made for their accommodation.

"I accompanied Donald McQueen, the best cragsman on the island, on several occasions to the cliffs to see his method of catching Fulmars. All

the men are expert climbers and fowlers, for the birds that breed on their islands are almost the only source of their wealth. On one occasion we climbed down to a grassy platform where several Fulmars were sitting on their nests. When within about ten feet of them, he slowly passed a long rod, at the end of which was a horsehair noose, quietly towards one of the birds, and then deftly placed the fatal noose over its head and drew the fluttering captive towards him. Another and another were secured in the same way and the eggs taken. Soon after their capture they vomited a large amount of amber-coloured oil; most of it came from the mouth, but a little came through the nostrils, especially when the poor bird was dying. During the Fulmar harvest in autumn the birds, when caught, are made to vomit this oil into dried gullets of the Gannet, which the fowler carries round his waist. We repeatedly saw great numbers of Fulmars sitting on the water; and Donald told me that the bird often dives, but does not stay down long. He said, in proof of his assertion, that the bird often takes the bait from the long lines. He also told me that whale-blubber was the Fulmar's favourite food; and I found that its stomach always contained an oily mass mixed with sorrel, which it probably takes to relieve the fatty nature of its other food.

"I steamed round the islands of the St.-Kilda group on the 14th of June, in the 'Dunara Castle,' a gun being fired several times to frighten the birds from the cliffs. The scene which ensued after the report had echoed amongst the rocks beggars all description. The myriads of birds were past all belief; the air was darkened with their numbers; still the cliffs were white with birds, and I calculated that not more than one in ten had risen. The Fulmars filled the air like large snowflakes, and the hordes of Puffins looked like a huge swarm of bees darkening the air as far as we could see. Myriads of birds swept round the vessel or filled the air above; the face of the cliffs seemed crumbling away as the living masses swept seawards; yet, singularly enough, little noise was made beyond the humming of countless wings. The mighty peaks of these solitary ocean rocks were indistinctly seen through the surging cloud of birds that seemed almost as if it would descend and overwhelm us. Then as we passed the stacks of Borreay the Gannets were disturbed from their nests. Still the green parts of the cliffs were white with sitting Fulmars, still the birds kept pouring from the rocks, going out to sea, and making way for new comers crowding up at every moment. It is curious how the Fulmars keep to themselves, seldom congregating with other species. Tens of thousands of Puffins, however, share the cliffs with them, and lower down, near the water, Kittiwakes cluster on every bit of vantage ground, and Guillemots and Razorbills, in endless rows, stand, sentinel-like, on every convenient ledge. No place in the world can excel St. Kilda as a

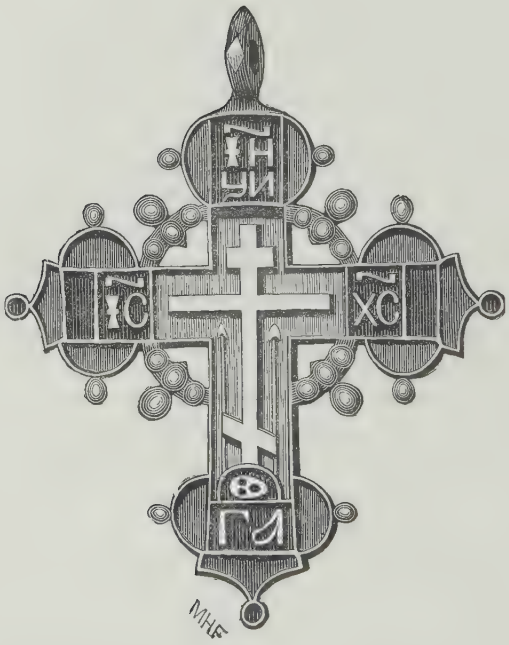
breeding-place for sea-birds, and few, indeed, can boast of such enormous numbers. When the young Fulmars are almost full-grown, the event of the year at St. Kilda takes place; the Fulmar harvest is commenced. The birds are caught in great numbers, oil and fat are extracted from them, their feathers are exported, and the bodies, salted, are preserved for winter provision."

The Fulmar only lays one egg, which is rough and chalky in texture, with little or no gloss, and pure white. The eggs soon become considerably stained by contact with the peaty soil; they vary considerably in size, the small ones doubtless belonging to the small race of Fulmar which is said to frequent the Atlantic. A series of eggs brought by Dixon from St. Kilda vary in length from 3·2 to 2·6 inch, and in breadth from 2·1 to 1·85 inch. The egg of the Fulmar cannot readily be confused with that of any other British species, its peculiar texture and musky smell distinguishing it at once. Both birds assist in incubating the egg, large bare sitting-spots being observed on males as well as females. It is said that the Fulmar only lays one egg in the course of the season, but this is not very probable. The young birds are fed by their parents with an oily substance ejected into the mouth of the nestling: as soon as they are able to fly they quit their birthplace for the open sea.

There is no difference in the colour of the sexes in the Fulmar. The typical adult Fulmar, which breeds on St. Kilda, has the head and neck creamy white, the rest of the upper parts are pale slate-grey, every feather obscurely margined with white; the quills are brown, suffused with slate-grey; there is a dark brown spot in front of the eye, and the entire under-parts, including the under wing-coverts and axillaries, are white, very slightly suffused with buff on the chin, breast, and belly. Bill greenish yellow, greenest on the nasal tubes; legs and feet pale flesh-colour; irides hazel.

There are probably few birds of which less has been known regarding their changes of plumage than the Fulmar. Young in down are described as sometimes pure white and sometimes brownish grey, shading into white on the breast. Young in first plumage appear to have been undescribed; but Dixon was assured, by one of the most intelligent natives of St. Kilda, that they did not differ from their parents. Brown birds are said to be very rare on St. Kilda; but of the examples obtained on our coasts, brown birds are most frequent, both facts apparently pointing to the conclusion that the brown birds are immature. Major Feilden is of that opinion, and Professor Malmgren states it as a positive fact. On the other hand, an example in my collection, obtained by Mr. Snow on the Kurile Islands, some time between May and July, is in full moult, the new feathers being dark grey. It is not very creditable to British ornithologists that this

question should not long ago have been cleared up; but an example in Hargitt's collection, obtained by Mr. H. C. Müller on the Faroes, in August, seems to prove conclusively that the young in first plumage exactly resemble adults. It is an example of the usual light phase, and large masses of down are still adhering to the upper and under tail-coverts.



Genus PROCELLARIA.

The genus *Procellaria* was recognized by Linnæus, in the 12th edition of his 'Systema Naturæ' (i. p. 212). The Stormy Petrel, the *Procellaria pelagica* of Linnæus, and the *Procellaria procellaria* of Brisson, is the type.

The typical Petrels are small birds, with a length of wing from $4\frac{1}{2}$ to $6\frac{1}{2}$ inches. The wings are long and pointed, but the second primary is the longest. The tail is more than half the length of the wing, but is sometimes wedge-shaped, generally nearly even, and often forked. The tarsus is alway much longer than the bill, and generally considerably longer than the middle toe; it is reticulated all round. The hind toe is almost obsolete. The bill very closely resembles that of the Fulmars, the nasal tubes occupying the basal half and the maxillary unguis the terminal half.

There are about a dozen typical Petrels, which frequent the oceans throughout the world, except in the Arctic Regions. Two only are European, both of which breed on our coasts.

In their habits, mode of nidification, and in the number and colour of their eggs they scarcely differ from the Fulmars or Shearwaters.

PROCELLARIA PELAGICA.

STORMY PETREL*.

(Plate 56.)

Procellaria procellaria, *Briss. Orn.* vi. p. 143 (1760).
Procellaria pelagica, *Linn. Syst. Nat.* i. p. 212 (1766); **et auctorum plurimorum** —(*Temminck*), (*Naumann*), *Dresser*, *Saunders*, &c.
Thalassidroma pelagica (*Linn.*), *Vigors*, *Zool. Journ.* ii. p. 405 (1826).
Hydrobates faeroeensis, *Brehm*, *Vög. Deutschl.* p. 803 (1831).
Thalassidroma melitensis, *Schembri*, *Orn. del Gruppo di Malta*, p. 118 (1843).
Procellaria lugubris, *Natterer*, } *fide Bonap. Consp.* ii. pp. 196, 197 (1857).
Procellaria melanonyx, *Nilss.* }
Procellaria melitensis (*Schembri*), *C. A. Wright*, *Ibis*, 1864, p. 154.

The Stormy Petrel has numerous breeding-places in the British Islands, but in consequence of its preference of a wide expanse of ocean, shared in common with all birds of this family, it is not known to nest anywhere on the east coast of England or Scotland. It breeds in the Channel and Scilly Islands, probably on Lundy, and certainly on various islets off the Welsh coast. It is generally distributed during the breeding-season on the islands off the west coast of Scotland, including Soay, one of the St.-Kilda group, and the Orkneys and Shetlands. It has many breeding-places in the islands off the Irish coast, especially the Blasquets. Except during the breeding-season, this little bird seldom visits the coast, but after gales it is often picked up inland. In autumn and winter it wanders far, and has been taken in various places all round the British coasts, especially on those of the eastern and southern counties, where large flocks are often seen.

The Stormy Petrel is probably an Atlantic species, although it has not yet been found breeding on the American coasts. In Norway it has been seen as far north as the Loffoden Islands, but it is not known that it breeds anywhere on the Scandinavian coast, and it is only a rare straggler into the Baltic. It breeds on the Faroes, but is a rare bird in Iceland, although it is occasionally seen on the American coasts, from lat. 64° in Greenland to the Bay of Fundy. It has not been recorded from the Azores; but it

* The words Stormy Petrel are doubtless a very ungrammatical combination, as many other familiar English words are; but that is no reason why they should be altered, although they may have offended the ears of Yarrell and his academical friends. The expression "Stormy Petrel" is "as familiar in our mouths as household words." Ancient landmarks cannot thus be lightly removed: a conservative nation like the English will never permit their language to be modernized by such classical pedantry.

breeds off the coast of Brittany and in several localities in the west Mediterranean. It is found on the coasts of Spain and Portugal, the Canaries and Madeira, the west coast of Africa, and round the Cape as far north as the mouth of the Zambesi on the east coast. The Stormy Petrel has no near ally. On the Galapagos Islands, in the Pacific, a tropical form of the Stormy Petrel occurs, *Procellaria tethys*, very nearly allied to the Atlantic species, but differing principally in having no dark tips to the upper tail-coverts, and no white tips to the axillaries and under wing-coverts; the tail is perceptibly forked.

The Stormy Petrel is the smallest web-footed bird. On the wing, if looked down upon, its black upper parts with conspicuous white rump, its size, and its flight might cause it easily to be mistaken for a House-Martin, were it not that it is never seen on land. It is strictly an oceanic bird, and even during the breeding-season, when it is compelled to come on shore, it only visits its young after dark. Nevertheless it would be a mistake to suppose that the Stormy Petrel is a nocturnal bird. All day it may be seen, generally in small flocks, flitting over the waves in search of food, and following in the wake of ships, where it has learnt by experience to keep a sharp look-out for any floating oily matter that may be thrown overboard. The sailors call these birds "Mother Carey's Chickens," and foolishly fancy that because they are black, their presence is an unlucky omen and foretells a storm. This superstition is perhaps all the more devoutly believed in because the Stormy Petrel is almost the only bird that is not frightened away by a storm. Its unrivalled power of flight enables it to follow the undulations of the waves with the greatest ease, and in heavy gales it is supposed that it can even find shelter behind the crests of the billows, skimming along in comparative calm under their lee. It can swim on the surface with the greatest ease, but is almost constantly seen on the wing, as if only resorting to the water when compelled to do so in order to pick up its food. It has a curious habit of hovering over the surface of the waves, and paddling with its feet as if walking on the water, whence its name of Petrel or Little Peter. It probably finds abundance of oleaginous matter of various kinds floating on the surface of the waves. Its stomach is always found full of oil, and when caught it disgorges a small quantity of oil. Some naturalists suppose that it feeds on small jelly-fish, and that it has the power of decomposing them in its stomach, and of recombining the elements into oil. The wonders of organic chemistry are no doubt very great, but the amount of oil which finds its way to the surface of the ocean is probably quite sufficient to provide an ample supply for the Petrels which feed upon it.

The Stormy Petrel is a very silent bird, only at their breeding-grounds are their notes heard, a plaintive *weet*, sometimes preceded and sometimes followed by a low guttural rattle. The birds arrive at their breeding-

grounds about the middle of June. When Hewitson visited one of their colonies in the Shetlands on the 31st of May the birds had not arrived; on the 16th of June they were in the nest, but on the 30th of June a few had laid their egg.

The Stormy Petrel is generally described as breeding in June and July; but that this is not always the case, I know from personal observation. In 1856 my friends Mr. and Mrs. Mark Hutchinson invited me to join them in a visit to the Blasquet Islands, off the coast of County Kerry. My friend was an artist and persuaded Mr. Grimshaw, a brother artist whom he met in Dingle, to complete the quartette. We borrowed a couple of regulation tents from a naval officer, and lived in them on the island of Inishmackillaun from the 20th of August to the 18th of September. We pitched our tents near the centre of the island, not far from a magnificent pile of rocks, whence we obtained a panoramic view of our position. More than half the horizon was sea; to the east we looked upon the rest of the Blasquet Islands; close to us towered the lofty peak of Inishnubro, two or three hundred feet higher than we were. Beyond it, a little to the left, was the island of Inishtuiskero; still more to the left the imposing outline of the Tiraght Rock reared majestically from the waves; and again more to the left the Fore Rocks, dark and massive, just small enough for an Atlantic billow sometimes to dash over, relieved the monotony of the open sea. Beyond Inishnubro was the Great Blasquet, and further still the mainland beginning with the bold promontory of Sybil Head. Nearly due east we looked up Dingle Bay, and more to the right we could distinctly see the lofty peaks that surround Killarney. Beyond them our horizon was the coast of Iveragh as far as Valentia Island, and due south we could discern the two Skellig Rocks in the open sea. Our foreground for half a mile or so all round was a mass of rocks, here and there rising into a grassy knoll generally crowned with rocks. No tree of any description was visible; we did not find so much as a shrub on the whole island, unless half a dozen scattered bramble bushes may be allowed to club together and unitedly attain to the dignity of shrub. The only houses on the island were a couple of cabins, half above and half under ground, without window or chimney, and with no mortar in the walls.

Whichever way we turned we could see nothing but rocks and piles of rocks, with grassy slopes between, where rabbits abounded and a few sheep grazed. The coast was grand beyond description, most of the island being at an elevation of three or four hundred feet above the level of the waves. Rocky promontories stretched far into the sea; huge masses of rock protruded from the ocean and rose one or two hundred feet high. Here the waves dashed against perpendicular cliffs, and there they foamed and fretted against craggy piles of rocks; and in many places the sea had hollowed out caves underneath the cliffs or worn chasms in the coast, which

extended up into the mainland like Norwegian fjords. Such was the home of the Stormy Petrel; but at first we did not suspect the existence of these birds on the island. The natives (with whom we were obliged to converse through our "buttons," a young Celt who accompanied us to do the dirty work) continually assured us that we should soon be able to add the dainty dish of fried "Blasquet Chickens" to our modest *menu*; but it was not until the 11th of September that they were able to produce these wonderful birds, which proved to be young Stormy Petrels, as large almost as their parents, but half feathers half down. Cooked on toast like Snipe, we found them delicious eating, very rich, but not at all fishy. As soon as we discovered that we were encamped in the midst of a colony of these interesting birds we commenced a diligent search, and soon found plenty of young, besides catching a few old birds which were still sitting on unhatched eggs. The nests, which seldom consisted of more than a dozen blades of dead grass, were placed in holes in the rocks or the rough walls put up to protect the little potato-patches from the sheep. We could often detect their presence in the evening by the faint cry of the young bird clamouring for food, and in places where the loose stones had been piled into heaps we found that the removal of half of them often disclosed several nests to view.

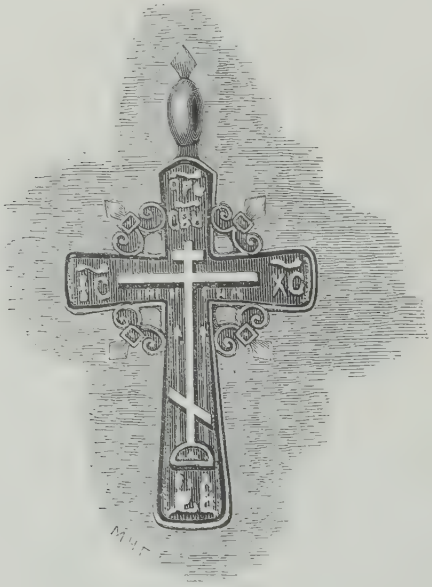
On the 17th of September I took the boat and crossed over to the adjoining island of Inishnubro, and found many young Petrels and a few still unhatched eggs. On this island the nests were principally on the steep grassy slopes in old rabbit-burrows. We never by any chance saw a Stormy Petrel on the wing during the day; but when the nights became enlivened by moonlight we could see them flying about like Bats, bringing food to their young. So far as we were able to judge, this was entirely oil. As soon as the young bird was taken in the hand it disgorged a few drops of amber-coloured oil, and in none did we find any solid matter in the stomach.

One egg only is laid, rough in texture and without any gloss. When fresh laid it is nearly white, but soon acquires a creamy tint from contact with the greasy feathers of the bird. The eggs are almost always thinly sprinkled with minute reddish-brown specks, and not unfrequently there is an obscure zone of specks round the larger end, occasionally round the small end. They are scarcely more pointed at one end than at the other, and vary in length from 1·2 to 1·0 inch, and in breadth from ·86 to ·8 inch. They cannot easily be confused with the eggs of any other British bird; those of the Bee-eater, the Great Spotted Woodpecker, and the Dipper are about the same size, but may be distinguished in a moment by their glossy smooth shells.

The completely webbed foot of the Stormy Petrel is remarkable in a bird which appears so seldom to swim, and the spots on the eggs, minute though

they be, are exceptional in a bird which breeds in an absolutely dark hole. Both facts suggest the idea that the Stormy Petrel has changed its habits comparatively recently. Why it should have changed them, or under what extraordinary circumstances, it would be vain to conjecture.

The Stormy Petrel is about the size of a Sparrow. There is no difference in the colour of the sexes in this species. After the autumn moult the adult has the general colour of the upper parts slaty black, but the outer web of the greater wing-coverts and the innermost secondaries are narrowly margined with white; the sides of the rump and the upper tail-coverts are white, the latter broadly tipped with black; the general colour of the underparts is sooty brown, but the tips of the axillaries and under wing-coverts are white. Bill, legs, and feet black; irides hazel. It is not known that immature birds differ from adults in colour, but in summer the slaty black of the upper parts fades into a sooty brown. Young in down are uniform greyish brown.



PROCELLARIA LEACHI.

LEACH'S FORK-TAILED PETREL.

(Plate 56.)

Procellaria leucorhoa, *Vieill. N. Dict. d'Hist. Nat.* xxv. p. 422 (1817).
Procellaria leachii, *Temm. Man. d'Orn.* ii. p. 812 (1820); **et auctorum plurimorum**—(*Bonaparte*), (*Nuttall*), (*Audubon*), (*Lawrence*), (*Baird*), &c.
Hydrobates leachii (*Temm.*), *Boie, Isis*, 1822, p. 562.
Procellaria bullockii, *Flem. Brit. Anim.* p. 136 (1828).
Thalassidroma bullockii (*Flem.*), *Selby, Brit. Orn.* ii. p. 537 (1833).
Thalassidroma leachii (*Temm.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 64 (1838).
Cymochorea leucorrhoa (*Vieill.*), *Coues, Proc. Ac. Nat. Sci. Philad.* 1864, p. 76.
Thalassidroma leucorhoa (*Vieill.*), *Degl. & Gerbe, Orn. Eur.* ii. p. 387 (1867).

The Fork-tailed Petrel was first discovered in the British Islands by Bullock in St. Kilda in the summer of 1818, a year after it had been described by Vieillot as a new species from an example obtained near Boulogne. It is only known to breed at two places within the limits of the British Islands—on the St.-Kilda group and on North Rona, off the west coast of Scotland. Elwes was informed by the natives that it breeds on Mingalay, and Gray states that there is an extensive colony on Rum (islands off the west coast of Scotland), but there is as yet no confirmatory evidence that such is the case. As a straggler or a storm-driven visitor this bird is known on most parts of the coasts of England, Scotland, and Ireland, and, like the Stormy Petrel, it is sometimes driven far inland by stress of weather.

Leach's Fork-tailed Petrel is apparently one of the very few birds whose geographical area is discontinuous. So far as is known, there are only three breeding-colonies of this species—one in the North Pacific, extending from the Kurile Islands to the Aleutian Islands; the other two in the North Atlantic, one on the islands in the Bay of Fundy, and the other off the Scotch coast on the islands of St. Kilda and Rona. Birds from the two Atlantic colonies may meet and intermarry in mid-ocean, but appear to be absolutely isolated from the Pacific colony. The latter have not been known in winter to stray further south than the Japanese seas, and in the Atlantic Ocean it has not been found further south than Madeira and the Mediterranean, and in neither locality can it be regarded as more than an accidental visitor.

The nearest ally of Leach's Fork-tailed Petrel is the Sandwich-Island Fork-tailed Petrel, *Procellaria cryptoleucura*, a slightly smaller bird, with white bases to all the tail-feathers except the middle pair.

Like its allies, the Fork-tailed Petrel is a thoroughly oceanic species, almost exclusively living out at sea, often met with even in mid-ocean following in the wake of a ship, fluttering along over the foam-crested billows, even in the height of the storm. It often follows the curve of the wave in its flight, fluttering down into the hollows, and skimming over the crest to disappear again in the trough of the sea, ever and anon pattering the water with its feet. It appears always to be more or less nocturnal in its habits, and only to come out in the daytime during cloudy weather. Like all the Petrels, it is most noisy at night. Its breeding-places may be instantly detected during the darkness by its incessant chirping notes; but in the daytime it is one of the most silent of birds, and the ground above a colony may be walked over repeatedly without their ever betraying their presence. At the approach of dusk it becomes active, and the apparently deserted islet is soon alive with noisy fluttering Petrels coming from and returning to the sea. It appears to be very helpless on the land, and is said only to rise with difficulty. It is often driven inland by continued bad weather, and is not unfrequently caught in the flight-nets on the Lincolnshire coast, especially in late autumn. It appears not to be very gregarious except during the breeding-season, when numbers may be found nesting close together, but several birds may often be noticed flying over the sea only a short distance from each other.

The food of the Fork-tailed Petrel is composed of small crustaceans and various kinds of mollusks floating on the surface of the sea. It is very fond of all kinds of fat or oily substances, which it picks up in the wake of fishing-vessels or steamers; this oily diet appears to be regulated by small scraps of sorrel.

Dixon, during his visit to St. Kilda in 1884, made the following notes on this bird:—"On the 10th of June I embarked with my guide, Donald McQueen, to explore the island of Doon, a precipitous narrow strip of land forming the southern horn of Village Bay. Doon has undoubtedly been joined to St. Kilda at no distant date, and at the present time may be reached at dead low-water during very low tides. It is very steep, and covered with rich grazing-grass over most of its surface. The cliffs on the southern side facing the Atlantic are very grand and rugged, but not particularly steep, and as the extreme point of the island is reached it narrows considerably, and there is little but bare and lofty rocks like ruined battlements and towers. The whole island is undermined by Puffins, which breed here in tens of thousands; they were flying round us like swarms of bees during the whole time of our stay. Kittiwakes and Great Black-backed Gulls were very common, as were also Guillemots, Razorbills, and Fulmars. On some of the grassy cliffs the ground is literally white with the latter birds, all sitting quietly on their eggs. The chief object of my visit to Doon was to obtain the eggs of the Fork-tailed Petrel, and I was successful

beyond my highest expectations. We crossed the bay in a small boat belonging to the smack, dangerously overcrowded, as many St.-Kildans as could scramble into her going with us to search for eggs and catch birds. Landing on this rock-bound islet was difficult work, owing to the strong swell. As we approached the shore one of the St.-Kilda men leapt out of the boat with a rope and assisted the rest to land. After taking off our boots we climbed up the cliffs and over the grassy slopes to the summit, where Donald told me we should find the birds we wanted. The place where the Petrels breed is on that portion of the island nearest to St. Kilda and at the summit. We had not been there long before Donald, who had been searching the numerous holes, drew forth a struggling Petrel from its nest; and I was delighted to find that it was the Fork-tailed species. Handing me the bird, he quickly drew forth the single white egg, and I then waited until he found another nest within a yard or so of the first. Placing my arm to the full extremity, I felt the little bird fluttering over its egg and drew it out. This nest also contained a single egg; and as I was catching the bird it uttered a few squeaking notes; excepting this, no other sound was heard during our stay. When held in the hand, it emits a small quantity of oil, precisely similar to that vomited by the Fulmar. Most of this oil comes from the mouth, but occasionally a little is squirted from the nostrils. Whilst I was packing the eggs Donald found another nest, which I took; and in less than half an hour I had taken eleven nests of this rare little bird. In two of the holes we found a bird, but no egg; they had probably gone into the hole to pass the day; and in one hole there was an egg, but no bird. We never found more than one bird on the nest, and only a single egg is laid. Some nests are larger than others, but in one hole the egg was laid on the bare ground. The holes vary considerably in depth (from two to four or five feet), and are burrowed in a precisely similar manner to those of the Puffin. The holes are made in the soft peaty soil, and it is very easy to unearth the nest. Sometimes the hole has two entrances, and then it is necessary to stop one end up to prevent the bird from escaping. The nests are made of dry grass, both round stalks and flat blades, a scrap or two of moss, and a few bits of lichen and roots. Those holes which are inhabited by Petrels usually have a little dry grass at the entrance. Many nests are placed close together, an underground colony in fact, and we found half a dozen nests within a radius of eight or nine yards. One of the birds we caught I let go again to watch its flight. It flew about for a few moments in a very erratic manner, as if dazed by the light, and then darted up and down, and flew round and round with rapid beats of its long wings very much like a Swallow or a Swift. We finally lost sight of it as it flew behind a large stack of rock and went out to sea. This bird, during its sojourn at St. Kilda at any rate, is almost exclusively nocturnal in its

habits, and keeps close to its hole during the day. The egg is incubated by both parents, for I took male and female birds from the nests, but, as previously stated, I never met with two birds in the same hole. Most of the nine eggs I obtained were quite fresh, but three of them were slightly incubated. When I dissected the Petrels we caught, I found the stomachs to contain an oily substance mixed with little bits of sorrel. We now left the Petrels and explored the remainder of the island with its swarms of birds. Donald snared a score or so of Puffins with his rod, passing the noose very skilfully over their heads as they sat unsuspiciously on the rocks. We obtained half a boat-load of Razorbills', Guillemots', and Gulls' eggs, and then returned with our booty to the slippery landing-place. The swell was rising fast, and we were anxious to get away, for we had no desire to be imprisoned there for days, as is sometimes the case, the sea rising so fast as to prevent any boat approaching the rocky shore. Donald told me that this Petrel is one of the earliest birds to come in spring, and one of the last to leave in autumn."

The breeding-colony of the Fork-tailed Petrel on the island of North Rona, one of the Hebrides, was visited by Mr. John Swinburne on the 20th of June, 1883. He found the birds breeding in burrows under and amongst the walls of some ruins. He dug out twenty-three nests in about an hour and a half, and could have obtained many others had he been inclined. He noticed that the birds breed in small colonies, and that in some cases one large main burrow in the walls of the ruins branched out at right angles into several other holes, each containing nests.

Brewer found this Petrel breeding in considerable numbers on a small island in Fundy Bay in a plantation of spruce and birch. The nests were in holes amongst the thick network of roots, which he had great difficulty in cutting away so as to reach them. The birds had only just begun to lay on the 24th of June. The following summer he visited the Green Islands further up the bay. Here there were no trees; the ground consisted of soft black mould, covered with grass, and honeycombed with the burrows of the Petrel. Many of the burrows were five feet long, twisting and twining in every direction, so that sometimes the nest was under the entrance to the long winding passage. In every case he found the male on the egg, and when caught they ejected through the nostrils a strong pungent musky oil of an orange colour. No mention is made of any nest; but Dresser quotes the account of the visit of Mr. G. A. Boardman to some islands on the American coast of the same bay, in which the burrows are compared to those of the Sand-Martin "under the sod," whilst others are dug under rocks. The passages are described as from two to three feet long, and as ending in a nest loosely put together of fine grass, with occasionally a few loose pebbles. A low note like *peer wit* was constantly heard in all directions, uttered by the birds in their holes.

Dall found this Petrel breeding on several of the Aleutian Islands west of Alaska. He described the burrows as made in the side of a turfy bank, and as from six inches to a foot in length, but always more or less curved to one side. Fresh eggs were found from the 10th of June to the end of July. The male was more often found on the nest than the female: when handled they disgorged a reddish oily fluid of a strong musky smell.

The Fork-tailed Petrel only lays one egg, which is pure white, with a more or less distinct zone of very minute specks round the large end. The overlying spots are reddish brown, and the underlying ones slightly greyer. Sometimes a few indistinct streaks or dashes of colour, often darker than the spots, occur on the large end of the egg. The eggs vary in length from 1·35 to 1·25 inch, and in breadth from 1·0 to ·92 inch. They are readily distinguished from those of the Stormy Petrel, the only species with which they are likely to be confused, by their much larger size. The shell is very fragile, chalky, and without any gloss. Only one brood appears to be reared in the year, and the young chick remains in the nest until it is fledged.

Leach's Petrel is about the size of a Swift. There is no difference in the colour of the sexes of this species. The adult after the autumn moult has the general colour of the upper parts greyish black, shading into greyish brown on the wing-coverts; the outer web of the greater wing-coverts and innermost secondaries and the tips of the scapulars are narrowly margined with white; the sides of the rump and the upper tail-coverts are white, but the longest of the latter are tipped with brown; the primary-coverts, wings, and tail are nearly black; the underparts are uniform sooty brown. Bill, legs, and feet black; irides hazel. It is not known that immature birds differ from adults in colour, but the general colour of the plumage becomes brown and faded in summer. Young in down are uniform greyish brown.

Genus OCEANITES.

When Wilson's Petrel was first described by Kuhl in 1820, he placed it in the genus *Procellaria*, and in 1834 it was removed by Nuttall to the genus *Thalassidroma*; but the two genera being synonymous, in 1840, Keyserling and Blasius, in their 'Wirbelthiere Europa's,' page 238, established the genus *Oceanites* for Wilson's Petrel, making it the type.

The Petrels belonging to this genus are so precisely similar to the typical Petrels, that a superficial observer would regard them as congeneric, nevertheless a recent morphologist has placed them in different families. Probably Forbes placed far too high a classificatory value on the characters of the muscles; but there can be no doubt that Wilson's Petrel belongs to a group of very highly specialized birds, which may be distinguished not only from all other Petrels, but from all other water-birds, by having the tarsus booted or plated, instead of being covered with small reticulations or slightly larger scutellations. The tarsus is slightly longer than in the true Petrels, but in other respects no important external characters present themselves.

There are several species belonging to this genus, all confined during the breeding-season to the Southern Seas. One only is an accidental visitor to Europe.

In their habits and nidification they precisely resemble their allies.

OCEANITES WILSONI.

WILSON'S PETREL.

Procellaria oceanica, *Kuhl, Beitr. Zool.* p. 136, pl. x. fig. 1 (1820).
Procellaria wilsoni, *Bonap. Journ. Ac. Nat. Sci. Philad.* iii. 1823, p. 231, pl. 9. fig. 2;
et auctorum plurimorum—*Audubon, Baird, Yarrell,* &c.
Thalassidroma wilsoni (*Bonap.*), *Nuttall, Man. Orn. Un. Stat. & Can.* ii. p. 434 (1834).
Thalassidroma oceanica (*Kuhl*), *Schinz, Europ. Faun.* i. p. 397 (1840).
Oceanites wilsoni (*Bonap.*), *Keys. & Blas. Wirb. Eur.* p. 238 (1840).
Oceanites oceanica (*Kuhl*), *Bonap. Compt. Rend.* xlii. p. 769 (1856).

Flocks of Wilson's Petrels have several times been observed off the south-west coasts of England, and stray examples have been obtained in the counties adjoining them. It has also been obtained in Norfolk, Sussex, Wiltshire, in the Isle of Wight, and in Yorkshire. It has not hitherto been observed in any part of Scotland or off the coasts of that country; and only one doubtful specimen is recorded by Thompson from Ireland. Stress of weather sometimes drives this bird inland; but as a rule it keeps far out at sea, and may thus visit our coasts far more frequently than is generally supposed.

So far as is known, Wilson's Petrel is confined during the breeding-season to the southern hemisphere, where it is probably a circumpolar bird, though its eggs have never been taken anywhere except on Kerguelen Land, an island in the extreme south of the Indian Ocean. During our summer it migrates northwards. In the Indian Ocean it has occurred on the African and Australian coasts, and as far north as the Bay of Bengal. In the Pacific Ocean it has occurred on the coasts of Australia, New Zealand, Peru, and Chili. In the Atlantic Ocean it visits the West Indies, along the course of the Gulf-stream from New York to St. George's Channel, the Azores, Madeira, and the West-African coasts as far south as the Cape. Wilson's Petrel has no ally with which it is likely to be confused.

During each of the four times that I have crossed the Atlantic, Stormy Petrels, about as large as a Swift, with white rump and square tail, have been abundant, sometimes in great numbers. These were undoubtedly Wilson's Stormy Petrel. They were most abundant near the American coast, but were often to be seen in mid-ocean, and a few followed the ship until we were in sight of the Irish coast. They fly very much like Swallows, and neither rain nor wind seems to interfere with their movements in the least. In stormy weather they took little or no notice of the

ship. We generally saw them in pairs; now and then a solitary bird was to be seen; seldom more than three or four were together, but on a few occasions we saw as many as twenty. In fine weather with a gentle breeze they were much more abundant, and the greater number followed in the wake of the ship. It was astonishing how suddenly the scattered birds collected in a mass like a swarm of bees when garbage was thrown out of the ship; they were down upon it in a moment from all points of the compass; some alighted at once upon the surface, others hovered over the tempting morsels with uplifted wings and extended feet. They can fly with great rapidity, now skimming over the waves with extended wings, now turning suddenly, or changing their course capriciously, with uncertain bat-like or butterfly-like motion. We never saw them dive, nor did we ever hear them utter a note.

The only reliable notes on the breeding-habits of Wilson's Petrel are those made by the Rev. A. E. Eaton, the naturalist attached to the recent Transit-of-Venus Expedition (Phil. Trans. clxviii. p. 133). Its only known breeding-place is on Kerguelen Island. About the third week in November they began to frequent Observatory Bay in large numbers, making their appearance during a strong breeze, which lasted several days. They were seen but little in the daytime, but towards evening they flew over the water like Swallows, some flying close to the ground far inland, following the course of the valleys or hovering round the inland cliffs. At that time they appeared to be making no preparations to breed, but only taking short cuts over the land from one part of the sea to another. When Thumb Point was visited the nesting colonies of Wilson's Petrel were discovered. After watching the birds flying to and fro about the rocks, he observed that they occasionally disappeared amongst the crevices in the piles of stones, or crept under loose masses of rock. Aided by their notes the exact position of several of the birds was ascertained, and they were easily caught when the stones were rolled aside. They were in pairs making preparations for laying, but he did not then obtain any eggs. They love to make their colonies on the slopes of shattered rocks, wherever there are suitable chinks and crevices, or dry places under stones and large boulders, either close to the sea, just above high-tide mark, or on the sides and summits of high hills. He obtained the first egg on the 22nd of January, and several others were taken in February from nests which had been marked during the previous month. The single egg is laid on the bare ground, either in a chance depression or in a shallow hollow made by the parent bird. When the colonies were visited at night with a lantern, some of the birds were observed on the wing, others were on their nests, uttering their notes at intervals of from two to five minutes. Guided by the notes the nests were easily found, but if the birds were alarmed they became silent and gave no clue to the whereabouts of their treasure. In

some cases the holes appeared to be frequented for a month or more before the eggs were laid.

The eggs of Wilson's Petrel are white, with a more or less obscure zone of minute reddish-brown spots generally round the large end. They are about the same size as those of the Fork-tailed Petrel, and consequently cannot be distinguished from them, averaging about 1·3 inch in length and ·9 inch in breadth. The food of Wilson's Petrel is not known to differ from that of the allied species. Of the migrations of this bird, and of the habits of the young when they can fly, nothing appears to have been recorded.

It is not known that there is any difference in colour between the sexes of this species. The adult, after the autumn moult, has the general colour of the plumage sooty black, palest on the head and neck, and darkest on the wings and tail; the greater wing-coverts have pale grey margins, the rump and upper tail-coverts are pure white, and the outermost under tail-coverts are slightly marked with white. Bill black; legs and feet black, with the centre of the webs yellow; irides dark hazel. It is not known that immature birds differ from adults in colour. Young in down are uniform brownish grey.

Three other species of this family have been included in the British list. A solitary example of the Capped Petrel (*Œstrelata hæsitata*) was caught on a heath near Swaffham, in Norfolk, in the spring of 1850 (Newton, 'Zoologist,' 1852, p. 3691). It is doubtful whether a second example has ever occurred in Europe, though it has been said to have occurred in France, and nothing is known of its breeding-haunts. It has occurred in the West Indies and probably breeds there.

A solitary example of the Cape Petrel, or Cape Pigeon (*Daption capensis*), is said to have been shot near Dublin on the 30th of October, 1881 (More, 'Ibis,' 1882, p. 346). This species is the most common Petrel in the Cape seas, its range extending eastwards to Tasmania, and westwards almost to Cape Horn. It is said to breed on the island of South Georgia, and to have occurred on the French coasts; but its egg appears to be undescribed.

A single example of Bulwer's Petrel (*Bulweria columbina*) was found dead on the banks of the Ure, near Tanfield in Yorkshire, on the 8th of May, 1837 (Gould, 'Birds of Europe,' part 22). It appears to be an inhabitant of the Atlantic Ocean, chiefly in the neighbourhood of Madeira and the Canaries. It breeds on the Deserta Islands, near Madeira, in a similar manner to other Petrels. Its egg is figured on Plate 56. As none of these three species of Petrel have occurred on the island of Heligoland, and only claim to be British birds in virtue of a single occurrence, which may or may not have been a voluntary visit to our islands, it has not been thought necessary to honour them with a special article.

Family PODICIPEDIDÆ, or GREBES.

The Grebes are a small well-defined group of birds, whose relationship to the Divers appears to have been hitherto generally admitted, though it is very difficult for an egg-collector to realize the fact. Forbes was of opinion that after the Divers the Ducks were the nearest relations of the Grebes. Sclater unites them in an order with the Divers and the Auks, an alliance equally foreign to the notions of the field ornithologist. Gadow associates them with the Divers as one family (the Cormorants and the Penguins being two others), which may be regarded as greatly specialized descendants of the group of which the Ducks are the least modified surviving forms. Newton, in a highly characteristic Gladstonian sentence*, appears to regard the relationship of the Grebes from an agnostic point of view.

The Grebes are schizognathous in the arrangement of their palatal bones, which doubtless resemble those of the Divers, as no difference in this respect has been pointed out by Huxley. They also resemble the Divers very closely in the arrangement of their feather-tracts. The Grebes like the Divers have only one small notch on each side of the posterior margin of the sternum, but the lateral processes extend beyond the central projection. The myology of the two families also presents some points of difference.

Grebes are born covered with down, and after a few hours are capable of swimming. Young in first plumage moult the feathers of the head and neck in the first autumn, and they, as well as adults, moult all their small feathers in spring; and in autumn adult birds have a complete moult, the wing-feathers, like those of the Ducks, being cast so rapidly that for some weeks the birds are unable to fly.

The Grebes are formed expressly for diving; their plumage is soft and silky; their legs are placed far behind; their tarsi are very short and

* "Mr. Sclater thinks the *Pygopodes* seem to form a natural transition between the Gulls and the Penguins. The affinity of the *Alcidæ* or Auks (and through them the Divers or *Colymbidæ*) to the Gulls may be a matter beyond doubt, and there appears to be ground for considering them to be the degraded offspring of the former; but to the present writer it appears questionable whether the Grebes, *Podicipedidæ*, have any real affinity to the two families with which they are usually associated, and this is a point deserving of more attention on the part of morphologists than it has hitherto received" (Newton, 'Encycl. Brit., Ornithology,' p. 45). It is to be presumed that "them" refers to the Auks and "the former" to the Gulls.

almost as flat as a knife-blade; their wings are small, and their bills generally more or less elongated. Their most obvious peculiarities are the absence of a true tail and the peculiar webbing of the toes; all of these, including the hind toe, are furnished with lateral lobes, and the middle toe is united to the outer toes by a web at the base.

The Grebes appear to be all congeneric, so that the geographical distribution of the family is the same as that of the genus.

Genus PODICEPS.

The Grebes were included by Linnæus in his genus *Colymbus* together with the Guillemots and Divers. Brisson very wisely made three genera of this group, calling the Grebes *Colymbus*, the Guillemots *Uria*, and the Divers *Mergus*. These names would doubtless have been accepted by subsequent ornithologists had not the latter name been already applied by Linnæus to the Mergansers. Eleven years elapsed and in 1771 Tunstall revised the group, accepting Brisson's name of *Colymbus* for the Grebes, but uniting the Guillemots and Divers in one genus, *Mergus*. In 1787 Latham took the matter in hand in the 'Supplement to the General Synopsis of Birds' (i. pp. 296, 297), reinstated *Mergus* as the generic term for the Mergansers, revived *Uria* for the Guillemots, and restricted *Colymbus* to the Divers. For more than a hundred years this arrangement has been accepted with very few exceptions by every ornithologist of note, and right or wrong, rules or no rules, cannot now be set aside. If the rules do not permit of such a course, they must be made to do so (by special exception or otherwise). Under no possible circumstances can any proposal to transfer the name of *Colymbus* from the Divers to the Grebes be entertained for a moment. The Pied-billed Grebe, *Podiceps carolinensis** (being the *Colymbus podiceps* of Linnæus), becomes of necessity the type of the synonymous genus *Podiceps*.

It is profoundly to be regretted that Messrs. Baird, Brewer, and Ridgway, in their 'Water-Birds of North America' (ii. p. 425), should have allowed themselves to have fallen into the unpardonable blunder of transferring the generic term of *Colymbus* from the Divers to the Grebes. If the rules which they have adopted make such a course necessary, they must be

* Four new genera have been established at different times for the reception of this species, and Sclater and Salvin go so far as to place it in a separate subfamily. There are two reasons for not separating this bird generically:—first, genera containing only one species are very objectionable; and, secondly, that it would involve the use of the name *Dytes* for the European Grebes, a change of nomenclature which is too revolutionary to be entertained.

radically bad, and no true ornithologist should miss any opportunity of violating them on every possible occasion, and heaping upon them the ridicule, the abuse, and the contempt which they so richly deserve. The most extraordinary fact connected with their retrogade step is that the very men who have bound themselves by the fetters of this code, and made themselves slaves to such ill-considered rules, are the pioneers of modern ornithological science, who have only recently freed themselves from the bondage of the Binomial System!

The genus *Podiceps* contains about sixteen species, which are distributed throughout the temperate and subtropical portions of both hemispheres. Five species are European, two of which breed in the British Islands, whilst the other three only are winter visitors.

The following key is sufficient to distinguish any species of British Grebe of either sex in nuptial plumage :—

Fore neck chestnut	Great Crested Grebe	Ear-coverts chestnut.
	Little Grebe	
	Red-necked Grebe.	
	Sclavonian Grebe	Ear-coverts black.
	Black-necked Grebe	

In winter plumage they may be distinguished as follows :—

Lores and stripe over eye white	Great Crested Grebe	Wing 6·4 inch or more.
	Red-necked Grebe	
Wing from 5·8 to 5·2 inch	Sclavonian Grebe.	
	Black-necked Grebe	White extending on primaries as well as secondaries; bill recurved.
Wing 4 inches or less	Little Grebe.	

PODICEPS CRISTATUS.

GREAT CRESTED GREBE.

(Plate 39.)

Colymbus cristatus, *Briss. Orn.* vi. p. 38 (1760); *Linn. Syst. Nat.* i. p. 222 (1766); **et auctorum plurimorum**— *Temminck*, (*Naumann*), (*Baird, Brewer, & Ridgway*), *Saunders*, &c.
Colymbus cornutus, *Briss. Orn.* vi. p. 45 (1760).
Colymbus urinator, *Linn. Syst. Nat.* i. p. 223 (1766).
Podiceps cristatus (*Briss.*), *Lath. Ind. Orn.* ii. p. 780 (1790).
Colymbus longirostris, *Bonn. Encycl. Méth.* i. p. 54 (1790).
Lophaithyia cristatus (*Briss.*), *Kaup, Natürl. Syst.* p. 72 (1829).
Podiceps mitratus, *Brehm, Vög. Deutschl.* p. 953 (1831).
Podiceps australis, *Gould, Proc. Zool. Soc.* 1844, p. 135.
Podiceps hectori, *Buller, Essay on New Zeal. Orn.* p. 19 (1865).
Podiceps widhalmi, *Goebel, Journ. Orn.* 1870, p. 312.

The Great Crested Grebe is a somewhat local resident in the British Islands, but it has not hitherto been known to breed in Scotland. It breeds on the large lakes in Wales, and on suitable sheets of water in England, especially in the low-lying eastern counties, and in Oxfordshire, Warwickshire, Bucks, Notts, and Hertfordshire. North of Yorkshire it is much rarer, and occurs almost exclusively as a winter visitor. Though rare on the west coast of Scotland at that season, it has been known to stray as far north as the Shetlands, and is more frequent on the east coast. It breeds in Ireland on several of the large sheets of fresh water, and is occasionally obtained in winter in various other parts of the country.

Few birds have such an extended breeding-range as the Great Crested Grebe. It is not known with certainty to have occurred in the New World; but in the Old World it is a resident in suitable localities throughout the continent of Africa (though in the tropics it is probably only found at a considerable elevation), and in Australia, Tasmania, and New Zealand. It is found throughout Europe south of the Baltic; but north of the Mediterranean it is only a summer visitor, except in the British Islands. It is not known to have occurred in Iceland or Greenland, and has only once been recorded from the Faroes. It is a rare straggler to Norway, but is a regular summer visitor to Central and Southern Sweden and to South Finland. It is extremely abundant in South-western Siberia, and breeds in East Turkestan, Mongolia, and the valley of the Hoang-ho. It is a resident in the basin of the Caspian, and

winters on the Mekran coast, in Baluchistan, and in India, a few probably remaining to breed. It has not been recorded from South-eastern Siberia or the interior of China, but it winters on the coasts of Japan and South China. It is not recorded from the islands of the Malay Archipelago, apparently avoiding the tropics, like its congener the Little Grebe. It is rather a remarkable fact that the Australian and the New Zealand birds, so completely isolated as they appear to be from the rest, should not present any difference sufficient to entitle them to subspecific distinction.

To countries where the winters are severe the Great Crested Grebe is a summer visitor. In Central Germany it usually arrives late in March, in North Germany it is seldom seen before April, and north of the Gulf of Finland it arrives early in May. It remains at its breeding-grounds until the lakes begin to freeze, when it collects into flocks and migrates southwards to the coast. During winter these poor birds are remorselessly persecuted for the sake of their silky breasts, which form an important article of commerce as trimmings for ladies' dresses. Grebe-hunting, especially on salt water, is said to be capital sport, and many writers have devoted their pens to its glorification. The diving-powers of this bird are unequalled; the attention of the shooter is always strained to the utmost; in no kind of shooting is less time allowed for taking aim; and if small bags are made, no sport offers less of the weary waiting for a shot which is so tedious. Although the bird seldom takes wing when pursued, it is not unfrequently seen flying over the water at its breeding-grounds, sometimes at a considerable height. Its mode of flight exactly resembles that of a Duck—long neck extended, short wings moving with great rapidity and some noise, and outstretched feet doing duty for a tail. It is rarely, if ever, seen on the ground, and can only shuffle along with the greatest difficulty. Its food is entirely procured in the water, and consists of water-beetles and other aquatic insects, small fish, small frogs, and mollusks. The seeds and tender shoots of aquatic plants are also often found in its stomach; but instead of small stones or gravel, numbers of its own feathers plucked from the ventral region are mixed with its food. It is not known that this curious habit, which is more or less common to all the Grebes, is intended to assist digestion, but it has been remarked by many ornithologists in widely different localities—Naumann (father and son), Meves (father and son), Yarrell, Thompson, Macgillivray, &c. Its ordinary alarm-note is a loud clear *kek, kek*; but at the pairing-time another note, the call-note, may be heard—a loud, grating, guttural sound, like the French word *croix*.

The Great Crested Grebe is decidedly a gregarious bird. When I was stopping at Stolp, in Pomerania, three years ago, Dr. Holland was kind enough to pilot me to the Lantow See, a lake about four square miles in extent, and surrounded on three sides by pine-forests. At one end of the

lake was a large bed of reeds, and as we rowed towards it we saw quite a little fleet of Great Crested Grebes sail out. It was a most beautiful sight; there may have been thirty or forty of them. Every now and then one or two dived out of sight; occasionally a pair or two took wing; and by-and-by the rest flew away together, and, wheeling round, settled in the middle of the lake. Although it was the 30th of May the reeds had not attained a fourth of their ultimate height, and the Grebes had only just begun to breed. Many nests were empty, many contained only a single egg, and none of them contained more than two. Although the nests were exposed to the bird's-eye view of a passing Crow, on account of the smallness of the reeds none of the eggs were covered.

A week afterwards I found a very large colony of Great Crested Grebes on the Garda See, a lake close to the sea, about sixty miles west of the Gulf of Danzig. They were breeding in an immense reed-bed, and as our boat neared their nesting-grounds we saw the Grebes sailing majestically, not to say indignantly, out of the side of the reed-bed. As soon as we reached the place I put on my waders and was soon in a dense forest of reeds, where it was very easy to lose one's way. The water was above my knees, and the reeds were far above my head. After stopping to take the nest of a Great Sedge-Warbler with four eggs, I soon found the colony of Grebes. There were dozens of nests, but never very close to each other, and I soon filled my handkerchief with eggs. It was the 5th of June, and only about half the nests contained the full complement of eggs. The birds had evidently seen us long before we approached, and had had ample time to retreat with dignity. In the nests which contained three or four eggs they were warm and covered with damp moss; but in those containing only one or two they were uncovered and cold. This applied equally to nests on the outskirts of the reeds, where the eggs could be seen by a passing Crow, and to those hidden in the depths of the reed-bed. The natural inference is that the eggs are not covered until the female begins to sit, and that the object of covering them is not protective, at least in the technical sense in which that word is now used. The Grebes cover their eggs, not to conceal them from enemies, but to protect them from cold. In the recesses of a dense reed-bed white eggs are as inconspicuous as in a hole in a tree or in a bank.

The eggs of the Great Crested Grebe are green, as may be seen by looking through the hole against the light; but this ground-colour is almost entirely obscured by an irregular and often rough layer of chalky white. The large end is seldom much more rounded than the small end. They vary in length from 2·4 to 2·0 inch, and in breadth from 1·6 to 1·3 inch. Small eggs occasionally measure less in one of their dimensions than large eggs of the Red-necked Grebe; but in that case the other

dimensions always exceed the maximum of the latter species, so that the eggs of the two birds cannot easily be confused.

The adult male Great Crested Grebe in nuptial plumage has the general colour of the upper parts greyish brown, each feather with a paler margin; the anterior margin of the wing, the secondaries, and the whole of the underparts, including the axillaries and under wing-coverts, are white, with the exception of the flanks, which are brown mottled with chestnut; the back of the neck, the forehead, crown, and two conspicuous nuptial crests are uniform greyish brown; the lores, space round the eye, chin, and throat are pure white, gradually shading into bright chestnut on the nuptial tippet, the outer margin of which is nearly black. Bill red, bare space between the eye and the base of the bill blackish; legs and feet olive-green; irides crimson.

The adult female differs very slightly from the male, but is somewhat smaller; the nuptial crest and tippet are not quite so much developed, and the latter is not quite so brilliant in colour.

After the autumn moult the general colour of the upper parts is slightly greyer, especially the margins of the feathers; the flanks are much less mottled with chestnut; the nuptial crest is almost obsolete, and the nuptial tippet is only slightly indicated in the male and still less so in the female.

Young in first plumage very closely resemble the adult in winter; but the nuptial plume and tippet are entirely absent, and dark stripes on the sides of the head and neck somewhat resemble those of the young in down. These stripes on the head and neck are moulted in the first autumn, leaving the plumage very similar to that of the adult in winter, except that the sides of the head and the neck are suffused with brown. After the first spring moult a plumage is assumed resembling that of the adult, but the nuptial adornments are much smaller and duller in colour. Young in down are very comical little creatures, having the body brown and the head, neck, and underparts white, with longitudinal black stripes on the upper parts and on the breast, two transverse black stripes across the bill, and a grey patch on the side of the head.

PODICEPS RUBRICOLLIS.

RED-NECKED GREBE.

(Plate 39)

Colymbus colymbus, *Briss. Orn.* vi. p. 34 (1760).
Colymbus vulgaris, *Scop. Ann. I. Hist. Nat.* p. 78 (1769).
Colymbus grisegena, *Bodd. Tabl. Pl. Enl.* p. 55 (1783).
Colymbus subcristatus, *Jacq. Beitr. zur Gesch. d. Vög.* p. 37, pl. 18 (1784).
Colymbus parotis, *Sparrm. Mus. Carls.* pl. 9 (1786).
Podiceps ruficollis, *Lath. Gen. Syn. Suppl.* i. p. 294 (1787).
Colymbus rubricollis. *Gmel. Syst. Nat.* i. p. 592 (1788); **et auctorum plurimorum**—(*Temminck*), *Naumann*, (*Irby*), (*Danford & Harvie-Brown*), (*Bogdanow*), (*Bewick*), (*Severtzow*), (*Palmén*), (*Elwes*), (*Nehrkorn*), (*Bonaparte*), (*Selby*), (*Fleming*), (*Gould*), (*Jenyns*), (*Montagu*), (*Yarrell*), (*Saunders*), &c.
Podiceps rubricollis (*Gmel.*), *Lath. Ind. Orn.* ii. p. 783 (1790).
Podiceps subcristatus (*Jacq.*), *Bechst. Orn. Taschenb.* ii. p. 351 (1803).
Colymbus cucullatus, Colymbus nævius, *Pall. Zoogr. Rosso-Asiat.* ii. p. 355 (1826).
Pedetaithya subcristatus (*Jacq.*), *Kaup, Natürl. Syst.* p. 44 (1829).
Podiceps canogularis, *Brehm, Vög. Deutschl.* p. 958 (1831).
Podiceps griseigena (*Bodd.*), *Gray, Gen. B.* iii. p. 633 (1846).

The Red-necked Grebe is a regular winter visitor to the British Islands, most numerous in severe seasons. It occurs sparingly on almost the entire eastern coast-line of Scotland and England, from the Orkneys south and west to Kent, Cornwall, and the Channel Islands; but in the Shetlands it is rare. It is less frequent on the west coast of Scotland and England; and Thompson only records four examples as having been killed in Ireland.

The Red-necked Grebe is almost a circumpolar bird; but the American ornithologists regard the birds inhabiting their continent and East Siberia as specifically distinct from those inhabiting Europe and West Siberia. The difference is only one of size, and the variation of both races is so great that the dimensions overlap, although it seems probable that there is a discontinuity of the areas of distribution, as neither Dybowsky nor any other Siberian traveller has met with a Red-necked Grebe in the valley of the Yenesay, where the Sclavonian Grebe alone represents the family. There is no satisfactory evidence that the Red-necked Grebe has ever bred in Iceland, the Faroes, or in the British Islands. In Scandinavia it is a resident south of the Arctic circle, and is a common summer visitor to Archangel, but it has not been recorded from the lower valleys of the Petchora or the Obb. It breeds in South-west Siberia, Turkestan, and

the basins of the Caspian and Black Seas. It does not appear to breed south of the valley of the Danube, nor west of the valley of the Rhine, occurring only on migration or in winter beyond these limits. To the basin of the Mediterranean it is a comparatively rare winter visitor, though it is said that a few remain to breed in Algeria and Morocco. The eastern form of the Red-necked Grebe breeds in the valley of the Amoor and Kamtschatka, and winters in the Japanese seas. On the American continent its range extends across Behring Straits to Greenland, breeding throughout Alaska and British North America south of the Arctic circle. It winters in the Northern United States, on the Pacific coast as far south as Vancouver's Island, and on the Atlantic coast as far south as New York, a few remaining to breed in the extreme northern United States. The eastern form may be distinguished under the name of *Podiceps rubricollis holbœlli**; it averages an inch longer in length of wing and half an inch in length of bill, the mean between the two races being seven and a quarter inches in length of wing, and two inches in length of bill. The Red-necked Grebe has no other very close ally.

It is a very curious fact that the Red-necked Grebe should never remain in this country to breed, and illustrates the remarkable force of habit which seems to compel birds to return if possible to the place of their birth in spring. In North Germany it is a very common bird, arriving late in March or early in April, and leaving again in October. It is almost exclusively an inhabitant of lakes and ponds, where sedge or reeds abound. On small ponds solitary pairs are found, but on the larger lakes great numbers breed together, though the nests are scattered up and down amongst the reeds, and not clustered together in a colony. The nests are sometimes placed in the recesses of the thick reed-beds, but quite as often they can be seen at a considerable distance in localities where the reeds are only half-grown and thinly sprinkled over the water. The nest is always floating, so that it can rise or fall with the water, and is considerably less than that of the Coot. It is somewhat carelessly made of reeds and decayed water-plants, and near each nest is a sort of sham nest, or foundation of a nest, merely a few reeds laid together, which is

* The synonymy of the eastern form is as follows:—
Podiceps rubricollis major, *Temm. & Schleg. Faun. Japon. Aves*, p. 122, pl. 78 B (1847, *nec Bodd.*).
Podiceps holbœllii, *Reinh. Vid. Meddel.* p. 76 (1853).
Podiceps cooperi, *Lawr. Baird's B. N. Amer.* p. 893 (1858).
Podiceps affinis, *Salvad. Atti Soc. Ital.* viii. p. 45 (1866).
Podiceps griseigena, *var.* hölbolli, *Coues, Key N.-Amer. B.* p. 337 (1872).
Podiceps griseigena holbœlli, *Coues, 2nd Check-List*, no. 847 (1882).
Colymbus hölbœllii (*Reinh.*), *Baird, Brewer, & Ridgway, Water-Birds N. Amer.* ii. p. 428 (1884).

used as a roosting-place for the parent which, for the time being, is not occupied with the incubation of the eggs. Fresh eggs may be obtained during the first half of May. When the third egg is laid the bird begins to sit; but it is ever on the look-out for danger, and long before the nest can be discovered, the approach of an intruder has been observed, the eggs have been carefully covered with black weeds to keep them warm, and the bird may be seen apparently feeding at a distance, as innocent and unconscious as possible.

The number of eggs is usually three, often four, and they vary in length from 2·1 to 1·9 inch, and in breadth from 1·4 to 1·25 inch. The ground-colour is green, but this is so coated over with chalky white, of a more or less irregular and rough texture, that it can only be seen here and there. They are smaller than eggs of the Great Crested Grebe, though both dimensions overlap, but never on the same egg. This is also the case with the eggs of the Black-throated and Sclavonian Grebes, which are always smaller.

The Red-necked Grebe very closely resembles in its habits the Great Crested Grebe, and on the lakes at Riddagshausen, and in other places, it breeds in the company of its larger ally. Its food, mode of flight, wonderful power of diving, and great difficulty in walking are the same. Its notes are very similar, the alarm-note being slightly shriller, and the call-notes more guttural and more resembling a scream.

The adult male Red-necked Grebe in nuptial plumage, with the exception of the head and neck, very closely resembles the Great Crested Grebe; but the general colour of the upper parts is a somewhat darker brown, and the pale margins of the feathers are much more obscure. The colour of the head and neck is very different, the nuptial crests are much shorter and scarcely separated from each other, whilst the tippet is nearly obsolete. The forehead, crown, and hind neck are olive-black, which colour extends to the lores and to the eye; the chin, upper throat, and sides of the head below the eye are grey, shading into white, apparently to emphasize the black hood and the chestnut lower neck and upper breast. Bill black, but the lower mandible and the sides of the upper mandible yellow at the base; bare space between the eye and the base of the bill reddish black; legs and feet dull green, darkest at the joints; irides brownish red. The adult female closely resembles the male in colour, but is slightly smaller in size. The winter and immature plumages of this bird are scarcely to be distinguished from those of the Great Crested Grebe, but it may be recognized by its smaller size and by the absence of the white stripe extending from the lores over the eye. Young in down have the upper parts dark brown, striped with white on the head and neck, and with pale brown on the back; the underparts are white, striped and spotted on the throat with dark brown.

PODICEPS CORNUTUS.

SCLAVONIAN GREBE.

(Plate 39.)

Colymbus cristatus minor, } *Briss. Orn.* vi. pp. 42, 50 (1760).
Colymbus cornutus minor, }
Colymbus auritus, *Linn. Syst. Nat.* i. p. 222 (1766) *.
Colymbus nigricans, *Scop. Ann. I. Hist. Nat.* p. 77 (1769).
Colymbus caspicus, *S. G. Gmel. Reise Russl.* iv. p. 137 (1784).
Podiceps nigricans (*Scop.*), *Lath. Gen. Syn. Suppl.* i. p. 294 (1787).
Colymbus cornutus, *Gmel. Syst. Nat.* i. p. 591 (1788); **et auctorum plurimorum** (*Temminck*), *Naumann*, (*Latham*), (*Reinhardt*), (*Blakiston*), (*Sclater*), (*Severtzow*), &c.
Colymbus obscurus, *Gmel. Syst. Nat.* i. p. 592 (1788).
Podiceps obscurus (*Gmel.*),
Podiceps cornutus (*Gmel.*),
Podiceps caspicus (*S. G. Gmel.*), } *Lath. Ind. Orn.* ii. pp. 782, 784 (1790).
Podiceps arcticus, *Boie, Reise durch Norw.* p. 308 (1822).
Dytes cornutus (*Gmel.*), *Kaup, Natürl. Syst.* p. 41 (1829).
Podiceps ambiguus, *Less. Traité d'Orn.* p. 595 (1831).
Podiceps bicornis (*Linn.*), *Brehm, Vög. Deutschl.* p. 960 (1831).
Podiceps sclavus, *Bonap. Cat. Parzud.* p. 13 (1856).
Dytes auritus (*Linn.*), *Ridgway, Nom. N.-Amer. B.* no. 732 (1881).

The Sclavonian Grebe is a semi-arctic species, and is only a winter visitor to the British Islands, most abundant on the coasts of Scotland, but less so on the east coast of England. It is the commonest of the Grebes which visit the Shetlands, and is tolerably frequent in the Orkneys and the Western Islands of Scotland. It is an occasional straggler to the south coast of England and to Ireland, but is almost unknown on the west coasts of England.

The Sclavonian Grebe is a circumpolar bird, but does not breed north of the Arctic circle except in Norway. In Europe it is only found on

* The Grebes have been most unfortunate in their nomenclature. Linnæus knew very little about them; he appears only to have been acquainted with two of the European species—the Great Crested Grebe and the Sclavonian Grebe. His diagnosis of the latter was vague enough to include the Black-necked Grebe, and consequently has been sometimes ascribed to one and sometimes to the other, until the name of *Podiceps auritus* has ceased to have a scientific meaning. Modern ornithologists, bent upon making confusion worse confounded, have raked up two unknown names for the Little Grebe and the Red-necked Grebe, so that one is obliged to fall back upon the English names in order to be understood.

migration or in winter south of the Baltic. It breeds in Greenland, Iceland, and the Faroes, and winters in the North Sea, on the Atlantic coasts as far as Gibraltar, and in the Black Sea. It can only be regarded as an accidental visitor to the northern shores of the Mediterranean. In Asia it is extremely abundant in South-west Siberia, the basin of Lake Baikal, and in Dauria, but appears to be rarer in the Lower Amoor. It passes through Turkestan on migration, and winters in the Caspian Sea, and probably in the Yellow and Japan Seas, as Prjevalsky observed it in South-east Mongolia; and I have two examples from Japan and one from China. On the American continent it breeds in Alaska and throughout British North America south of the Arctic circle. It winters in the northern United States, in some of the western of which a few remain to breed. It is an accidental visitor to the Bermudas. It has no nearer ally than the Black-throated Grebe.

The Sclavonian Grebe leaves its breeding-grounds in Iceland in October, and appears on our shores during that month in small parties, the adult birds remaining paired during the winter, but frequently several pairs consorting together. It chiefly frequents sheltered bays and inlets on the coast, but occasionally appears on inland sheets of water as far as twenty miles from the sea-shore. It leaves us again late in April or during May; but its nests seldom contain eggs before June. It makes a nest near the banks of lakes, which, like those of its allies, is generally a floating structure composed of the decayed water-plants amongst which it is placed. Krüper occasionally found it on a tussock of grass in the water and once on a stone. The sitting bird carefully covers her eggs on the approach of danger and dives to a considerable distance to join her mate; but on one occasion, when the eggs were highly incubated, Krüper listened to the female crying on the nest, whilst the male attempted to frighten him away by suddenly rising out of the water in front of him, splashing with its feet in the water, and joining its cries to those of its mate. So persistent was it that Krüper returned to the shore for his butterfly-net, and when the performance was repeated caught the bird in it. The number of eggs never exceeds five. They are of precisely the same shape and colour as those of the allied species. They vary in length from 1·9 to 1·6 inch, and in breadth from 1·2 to 1·1 inch. They are smaller than eggs of the Red-necked Grebe and larger than those of the Little Grebe, but are indistinguishable from eggs of the Black-throated Grebe.

Both Krüper and Procter remarked the interesting habit of the old bird diving with her young under her wing, who were then conveyed for a considerable distance under water. In the nature of its food and in its habits this species differs very little from its allies. Its note is described as very similar to that of the Black-necked Grebe; but it is said to be somewhat less shy and to take wing more readily.

In the colour of its plumage at different ages and seasons the Sclavonian Grebe closely resembles the Red-necked Grebe; but it is a somewhat smaller bird, and the nuptial plumes are quite different: these consist of a chestnut crest on each side of the head, beginning on the lores and extending backwards above the eye; the nuptial tippet is somewhat more developed and is black instead of grey; the chestnut on the flanks is also somewhat more developed. Bill black, crimson at the tip and at the base of the under mandible; bare space between the eye and the base of the bill crimson; legs and feet olive-green, palest on the webs; irides crimson. In winter plumage it closely resembles the Red-necked Grebe and still more closely the Black-necked Grebe, which is about the same size. From the former it may be distinguished by its smaller size, the wing measuring 6 inches or under, instead of $6\frac{1}{2}$ to 8 inches; from the latter there are two good points of distinction—there is no white on any of the primaries, and the bill is straight instead of being slightly recurved. In the young in down the upper parts are dark brown, striped with white, especially on the head and neck, and the underparts are white. Krüper says that the white stripes on the back are entirely lost after a few days.

GREAT CRESTED GREBE'S NEST.

PODICEPS NIGRICOLLIS.

BLACK-NECKED GREBE.

(Plate 39.)

Colymbus auritus, *Briss. Orn.* vi. p. 54 (1760).
Colymbus auritus, *β*, *Linn. Syst. Nat.* i. p. 223 (1766).
Podiceps nigricollis, *Brehm, Vög. Deutschl.* p. 963 (1831); **et auctorum plurimorum**—*Degland & Gerbe, Dresser, Saunders,* &c.
Dytes nigricollis (*Brehm*), *Ridgway, Nom. N.-Amer. B.* no. 733 (1881).
Podiceps auritus (*Gmelin*), *Latham, Forster, Leach, Temminck,* (*Naumann*), *nec Linnæus.*

The British Islands may be regarded as lying beyond the confines of the breeding-range of the Black-necked or Eared Grebe. There is no authentic instance of its nest ever having been found in this country, although this Grebe breeds quite as far north in Siberia. It may possibly object, like the Great Sedge-Warbler and some other birds, to cross the English Channel or the Baltic Sea; but more probably our cold summers are the cause of its rarity, as it is almost as accidental a visitor to Pomerania. It is chiefly known in our islands as a rare visitor on spring and autumn migration, though a few have been obtained during winter. The fact that British examples have most frequently occurred on the east and south coasts of England seems to imply that they have formed part of the great stream of migration which reaches us *viâ* Heligoland. It has once been obtained on the Orkneys, once on the Outer Hebrides, and is a rare accidental visitor to the mainland of Scotland, Ireland, and the west of England.

The Black-necked Grebe has a somewhat similar range to that of the Little Grebe. It is a resident in the basin of the Mediterranean, but is a summer visitor to Central Europe and Southern Russia as far north as the Baltic and Moscow. To Norway, Sweden, and Finland it is only an accidental visitor. It appears to be a resident in South Africa, breeding in Damara Land, the Cape Colony, and the Transvaal. It has also occurred in Abyssinia. Finsch found it extremely common in South-west Siberia; Dybowsky met with it in Dauria; it passes through Turkestan on migration (where, according to Severtzow, a few are said to remain to breed)*, and winters on the Mekran coast and in Scinde. It has not been recorded from India or Burma, but it winters in China and Japan.

* Both the Sclavonian and the Black-necked Grebes are recorded by Severtzow as passing through Turkestan on migration. Severtzow calls them *Podiceps cornutus* and

On the American continent west of the Mississippi, from Great Slave Lake to Guatemala, a Black-necked Grebe is found which differs in many respects from the Old-World species, and has been regarded as subspecifically distinct under the name of *Podiceps nigricollis californicus* *. It is said to resemble the Sclavonian Grebe in not having the bill recurved and in having no white on the primaries.

In its habits the Black-necked Grebe scarcely differs from its allies. Its call-note is described by Naumann as a high, soft, but far-sounding *beeb*, which in the pairing-season is rapidly repeated and becomes a trill *bidder, vidder, vidder, vidder,* &c. Its notes are principally uttered in the evenings of hot days and in the warm nights of June and July. It is a very shy bird, and is more often heard than seen; it can only be made to take wing with great difficulty, and seeks safety by diving. Naumann says that it sometimes remains a minute under water, reappearing at a distance of 150 yards from the place where it plunged beneath the surface.

During the breeding-season it is only found on fresh water, on lakes or slow-flowing rivers where reeds and sedge abound. It arrives at its breeding-grounds in North Germany as soon as the hard frosts are gone, towards the end of March or in the beginning of April, remaining until it is driven away by ice and snow in October or November. The nest is concealed amongst reeds or sedge, and is generally a floating structure, like those of the allied species of Grebe; but it is occasionally placed on a tussock of grass or on fallen sedge. It is a small compact structure, not more than 9 inches across, and is composed of dead sedge mixed with grass and water-plants. When the nest is left the eggs are carefully covered with wet moss and rotten grass. The eggs are laid late in May; both parents assist in incubation, which lasts three weeks, and the young are able to fly by the end of July. The number of eggs is usually four, but five are sometimes found. Like those of other Grebes, they are creamy white in colour, but when held up to the light the green colour of the inside may be seen through the hole, and is sometimes traceable on the surface. They are considerably tapered at both ends, rough and irregular in texture, and vary in length from 1·9 to 1·7 inch, and in breadth from

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P. auritus. It is the former which is said to breed in Turkestan. Dresser and Saunders identify this with the Sclavonian Grebe; but Severtzow most probably followed the nomenclature of Pallas, whose *Colymbus auritus* is unquestionably the Sclavonian Grebe.

* The synonymy of the American form is as follows :—
Podiceps californicus, *Heerm. Proc. Ac. Nat. Sci. Philad.* 1854, p. 179.
Podiceps (Proctopus) californicus, *Coues, Proc. Ac. Nat. Sci. Philad.* 1862, pp. 231, 404.
Podiceps auritus, *var.* californicus, *Coues, Key N.-Amer. B.* p. 337 (1872).
Dytes nigricollis californicus, *Ridgway, Nom. N.-Amer. B.* no. 733 *a* (1881).
Podiceps auritus californicus, *Coues, 2nd Check-List,* no. 850 (1882).

1·25 to 1·1 inch. They cannot be distinguished from the eggs of the Sclavonian Grebe, but they are always larger than eggs of the Little Grebe, and smaller than those of the Red-necked Grebe. Neither dimension ever overlaps that of the former, nor do both dimensions ever overlap those of the latter.

The stomachs of the Black-throated Grebe generally contain small aquatic animals of all kinds mixed with some vegetable matter and, what is very curious, generally with quantities of its own feathers. In South Africa the Black-necked Grebe breeds in December, making a floating nest concealed amongst the rushes. It can scarcely be regarded as a gregarious bird: it is said to pair for life and to migrate in pairs; but in suitable localities its nests are often numerous, though never very close together.

The Black-necked Grebe principally differs from the Sclavonian Grebe in having the bill slightly recurved, the lores, chin, throat, and upper breast black, instead of chestnut, and the white on the secondaries extending on the inner webs of many of the adjacent primaries, a distinction which is of great importance in the identification of winter skins. Bill black; bare space between the eye and the base of the bill reddish black; legs and feet olive-green, paler on the webs; irides crimson. In its changes of plumage it does not differ from its allies in any important respect. Young in down are striped brown and black on the upper parts and white on the underparts.

PODICEPS MINOR.

LITTLE GREBE.

(Plate 39.)

Colymbus minor, *Briss. Orn.* vi. p. 56 (1760); *Gmel. Syst. Nat.* i. p. 591 (1788); **et auctorum plurimorum**—(*Latham*), (*Bewick*), (*Temminck*), (*Bonaparte*), (*Naumann*), (*Stephens*), (*Selby*), (*Yarrell*), (*Montagu*), (*Fleming*), (*Jenyns*), (*Gould*), (*Heuglin*), (*Swinhoe*), (*Gurney*), &c.
Colymbus fluviatilis, *Briss. Orn.* vi. p. 59 (1760); *Tunstall, Orn. Brit.* p. 3 (1771).
Colymbus fluviatilis nigricans, *Briss. Orn.* vi. p. 62 (1760).
Colymbus auritus, γ, *Linn. Syst. Nat.* i. p. 223 (1766).
Colymbus pyrenaicus, *Lapeir. K. Vet. Ak. Nya Handl.* iii. p. 111 (1782).
Podiceps minutus, Podiceps hebridialis, } *Lath. Gen. Syst. Suppl.* i. p. 294 (1787).
Colymbus hebridicus (*Lath.*), *Gmel. Syst. Nat.* i. p. 594 (1788).
Podiceps minor (*Briss.*), *Lath. Ind. Orn.* ii. p. 784 (1790).
Colymbus philippensis, *Bonn. Encycl. Méth.* i. p. 58, pl. 46. fig. 3 (1790).
Colymbus minutus (*Lath.*), *Pall. Zoogr. Rosso-Asiat.* ii. p. 358 (1826).
Podiceps novæ-hollandiæ, *Steph. Shaw's Gen. Zool.* xiii. pt. 1, p. 18 (1825).
Podiceps noctivagus, *Temm. Tabl. Méth.* p. 100 (1836).
Podiceps gularis, *Gould, Proc. Zool. Soc.* 1836, p. 145.
Sylbeocyclus minor (*Briss.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 64 (1838).
Sylbeocyclus europæus, *Macgill. Man. Brit. B.* ii. p. 205 (1842).
Podiceps philippensis (*Bonn.*), *Gray, Cat. Mamm. & B. Nepal*, p. 147 (1846).
Tachybaptus minor (*Briss.*), *Reichenb. Av. Syst. Nat., Natatores*, pl. 2 (1849).
Tachybaptus philippensis (*Bonn.*), Tachybaptus capensis, Tachybaptus gularis (*Gould*), } *Bonap. Compt. Rend.* xliii. p. 775 (1857).
Podiceps (Sylbeocyclus) tricolor, *Gray, Proc. Zool. Soc.* 1860, p. 366.
Podiceps fluviatilis (*Briss.*), *Degl. & Gerbe, Orn. Eur.* ii. p. 587 (1867).
Podiceps albescens, *Mandelli, fide Blanford, Stray Feath.* v. p. 486 (1877).

The Little Grebe is by far the commonest British species of this genus. It is a resident in all districts suited to its habits both in England, Wales, Scotland, and Ireland, extending to the Outer Hebrides and the Orkneys. To the Shetlands it is only a rare winter visitor from Norway. It appears only occasionally to breed in the Channel Islands, where it is best known as a winter visitor.

The Little Grebe is confined to the Old World, where it is a resident south of about lat. 42° in the subtropical portion of both the northern and the southern hemisphere, and in the tropics where a somewhat similar climate can be found at a high elevation. In Western Europe, in consequence of the influence of the Gulf-stream, its breeding-range extends twenty degrees

further to the north. It is not found in the Baltic provinces of Russia. To Pomerania, Denmark, and South Scandinavia it is only a summer visitor, though a few are said to winter on the southern shores of Sweden. It is a rare visitor to the Faroes. In Central Europe it is principally known as a summer visitor, but in the basin of the Mediterranean it is a resident. It is a resident in Africa south of the Desert, and in Madagascar, as it is also in Abyssinia at an elevation of from 5000 to 11,000 feet. It is a resident in Persia, Afghanistan, Eastern Turkestan, and North India. In Southern India it only breeds on the mountains, but in Ceylon and Burma it nests near the coast. It is not found in Siberia, nor is it recorded from Mongolia; but it is a resident in China, Japan, the islands of the Malay archipelago, and Australia. In South Australia it is partially replaced by *Podiceps nestor*, which ranges as far south as Tasmania; but in New Zealand another species occurs, *P. rufipectus*. Both these species may be distinguished by the white hair-like filaments on the crown. On the continent of America it is replaced by *P. dominicus*, a still more distinct though very closely-allied species, differing principally in having the fore part of the neck ash-grey instead of chestnut.

The Little Grebe is quite as aquatic in its habits as its congeners, but frequents, as a rule, smaller ponds and even running streams. On the larger lakes it is most abundant in winter, and at that season it is found on the sea-coast when the ponds are frozen. To the colder portions of its range it is only a summer migrant, arriving in Denmark in April and leaving again in September. It migrates by night in spring in pairs, but in autumn in flocks. When pursued it always seeks refuge by diving or by hiding itself in the nearest cover. It is rarely if ever seen on the wing during the breeding-season; but that its powers of flight are considerable its migrations abundantly prove; and Major Legge, in his excellent work on the Birds of Ceylon, mentions a flock which he saw fly for more than half a mile on the Colombo Lake, mounting fully twelve feet in the air in their endeavour to clear a small steamer which was crossing their course. It is a most expert diver, and obtains most of its food under the surface of the water; this consists of aquatic insects of various kinds, small mollusks, little fishes, and occasionally young frogs; some vegetable matter is also generally found in its stomach, and frequently quantities of feathers. Its note is a clear plaintive *weet* or *weet, weet*. It is extremely shy, and if necessary it can run away across an island or down the bank of a lake with great speed. Like the Sclavonian Grebe, it often swims away with its young under its wings to escape pursuit.

In this country the Little Grebe begins to breed late in April or early in May, and it is said that it often has a second brood in August. In Cashmere it lays in the middle of May, but in the Punjaub August and September are the favourite months, whilst in South Africa it probably

breeds in January. The nests are generally floating structures of weeds moored near an island in some reedy sheet of water; they are seldom hidden in the reeds, and frequently quite in the open. Hume says that in India they are sometimes built in the branches of a tree overhanging the water and a couple of feet above the surface; this is doubtless in localities liable to sudden floods. I once took a nest in the branches of a willow tree at Riddagshausen, near Brunswick, but the branch was on the water and the nest level with the surface. My son shot at a Waterhen and the report frightened the Little Grebe off the nest before she had time to cover her six eggs. This is the only nest of this bird which I have ever found with more than two eggs in it where they were uncovered. Andersson ('Birds of Damara Land,' p. 347) states that "out of the numerous nests I have taken and seen, in no one instance (except where the nest contained only one or two eggs) did I find the eggs uncovered." Hume remarks that the birds seldom sit much during the day in India, the combined heat of the sun and the fermentation of the weeds being probably sufficient for incubation. I have little doubt that the eggs are covered to keep them warm rather than to conceal them. Both in this country and in India the careful deliberate manner in which the bird takes up in succession two or three bunches of wet weed in her beak from the edge of the nest and deposits them on the eggs before diving into the water has been observed. It is very remarkable how some trifling details in the actions of birds are constant throughout the very extended ranges of some species, whilst other habits, such as the date of breeding and the position of the nest, are altered to suit special conditions.

Mr. Bryan Hook has furnished me with the following most interesting observations respecting the breeding of the Little Grebe on his father's property near Haslemere. It is much to be regretted that similar details are not more often recorded. "On the 25th of March I found a Dabchick's nest on one of our small ponds about a foot from the water's edge, partly concealed by a tuft of heather on the bank above it. The pond was at the bottom of a field where a man was ploughing, and at the end of each furrow as he passed the nest the bird first carefully covered her eggs, then slipped into the water without the slightest splash, and remained concealed under the water amongst the reeds close to the nest. A fortnight afterwards I found the old bird very reluctant to move, and when at last she did dive away, she left her eggs uncovered. Two days later I found the old bird sitting in the nest with two young, and all dived away on my approach, the young ones coming up about five yards from the shore, where they floated motionless. I did not see the young birds again until a fortnight later, when I found them on the nest, wonderfully grown and able to dive about fifteen yards. Nearly a month later, on the 30th of May, the two young birds were full-grown, and whilst one of the

parents took charge of them the other sat upon five eggs in another nest in a similar situation on the other side of the pond. She was very restless, constantly getting off and on the nest. At length she found me out, and after carefully covering her eggs slipped into the water behind the nest and remained there until I came up. Four days later some of the eggs were hatched. The birds slipped off the nest on my approach, but remained among the rushes close by. I waited a few minutes and then plainly heard the cheeping of a young bird, so I drove away the parent and immediately afterwards the young ones were floating a little away from the shore. The other parent bird had a young one further along the bank, so I ran towards it; but the young bird scrambled under the wing of its parent, who dived away with it. The young one, however, came to the surface about ten yards from shore. The young bird seemed able to dive unassisted about two yards. Old and young use their legs like a frog, horizontally, striking both at once, and bringing their feet together at the end of the stroke. I have seen the old ones diving in clear water some distance, but they did not use their wings. I spent the following day watching the Dabchicks through a telescope. One old bird was sitting on the nest, whilst the other dived for food, which she brought at intervals of about two minutes. When she approached the nest the young birds put their heads out from under the parent's wing and took the food the other parent brought. The moment her provision was disposed of, she was off for more, always diving from place to place. The morsel, when found, required a good deal of shaking before it was fit to be given to the young birds, and when prepared the parent dived with it in her beak, appearing again at the edge of the nest. Whilst I was watching her the bird on the nest caught sight of me, carefully covered the eggs that were still unhatched, and slipped into the water. On going up to the nest I found two of the young birds amongst the rushes on the margin of the pond. I retired, and after watching a few minutes, saw the old bird suddenly appear at the side of the nest, after diving several times underneath it and swimming once or twice round it. After fully two minutes of this manœuvring it landed on the nest and proceeded most carefully to remove the covering from the eggs and arrange it round the sides of the nest; then sitting upright for a moment and shaking out her feathers, she settled her breast upon the eggs. The other parent then came swimming up, and by its puffy appearance I think it had the youngsters under its wings. Seeing that all was going on well it probably deposited them on the nest, and then paddled gently off. An hour afterwards I found it very busy collecting weed to add to the nest; it made several journeys for the purpose, diving for the weed it used. After a time it brought some food, but finding the young ones would not take it, though it tried all round the nest, it ate it itself. On the next day both

birds were hard at work adding to their nest; a strong breeze was blowing, and the waves would in a very short time have washed it away if it had not constantly been added to. On one occasion I noticed that the eggs were uncovered, and ran to the nest as fast as I could, but one of the birds came back and covered the eggs in a moment. Two eggs were still unhatched, and one young bird was dead in the nest. This brood was evidently a failure; for eight days afterwards, on the 13th of June, I found that a third nest had been built near an island about fifteen yards from the bank, and one of the birds was sitting upon it. Only on one other occasion have I ever seen the eggs left uncovered, which makes me think that the bird only covers her eggs when she is driven from the nest. I once disturbed a Dabchick and her four young from the nest. They all dived away and disappeared in different directions, and when the young birds came up the parent swam alongside of them, and they scrambled under her wings, which she held up for the purpose. She then dived away, carrying with her the young birds, which might have been two or three days old."

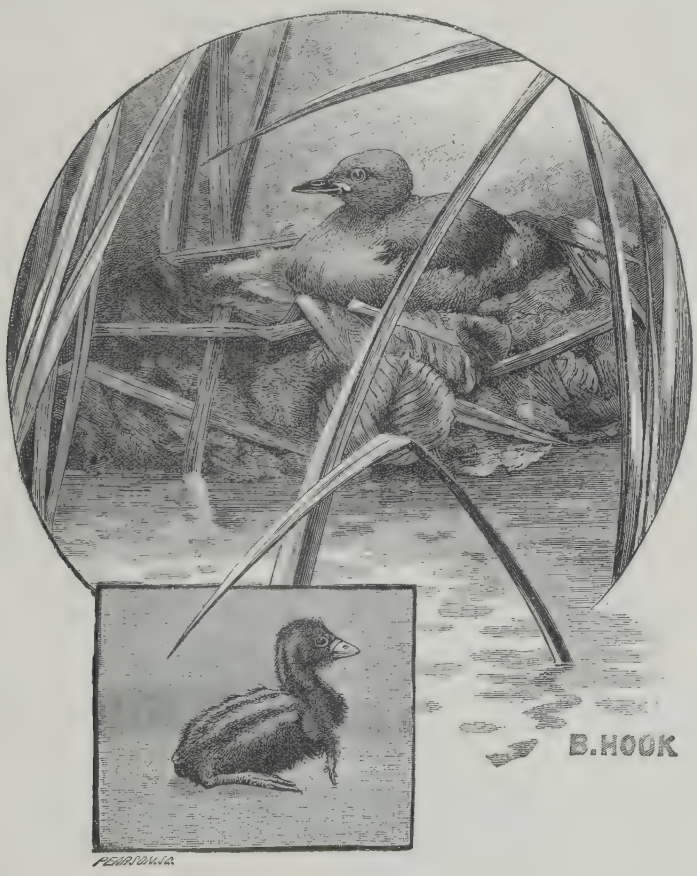
The number of eggs varies from three to six, but four or five is the usual clutch. They are somewhat rough in texture, without much gloss, and frequently tapered equally at both ends. When fresh laid they are dull white, but soon become stained a dirty buff, and always look green through the hole when held up to the light. They vary in length from 1·55 to 1·3 inch, and in breadth from 1·1 to ·9 inch. They cannot be mistaken for the eggs of any other British bird. They are always smaller than eggs of the Sclavonian Grebe; if one measurement equals the minimum of that of the latter species, the other always falls short of it.

As soon as the young are hatched they can swim with ease, and at the end of a week have mastered the art of diving, and are well able to take care of themselves.

The Little Grebe is less than half the weight of its nearest British allies, and is not nearly so large as a Teal. The adult male in nuptial plumage is dark brown, almost black, on the upper parts, except the quill-feathers, which are brown, and a varying amount of white on the secondaries; the chin, extending sometimes to the upper throat and underneath the eye, is black; the rest of the throat, the sides of the head, and the fore neck are chestnut; the remainder of the underparts are brownish black, except the axillaries and under wing-coverts, which are nearly pure white. Bill black, with a yellow-white tip, and greenish yellow at the angle of the mouth; bare space between the eye and the base of the bill blackish; legs and feet olive-green, paler on the webs; irides hazel. The female is slightly smaller and not quite so dark-coloured as the male. After the autumn moult the general colour is brown, shading into white on the chin, upper throat, lower breast, and belly. Young in first plumage closely resemble adults in winter plumage, but are a trifle paler on the upper parts, and the

white on the underparts is not so pure. After the first spring moult the underparts are mottled with white. Young in down are charming little creatures; the head, neck all round, and upper parts are nearly black, striped with rich chestnut-brown; the breast and belly are white, and there is a white V-shaped mark on the throat.

An example of the Pied-billed Grebe (*Podiceps carolinensis*) is said to have been shot near Weymouth in January 1881 (Sharpe, Proc. Zool. Soc. 1881, p. 734). This species breeds throughout the greater part of the American continent. It has occurred on the Bermudas, and may possibly have wandered to our shores, but no details of its alleged capture have been recorded.



LITTLE GREBE'S NEST.

Family ANATIDÆ, or DUCKS.

The Ducks and their allies form a large and well-defined family, though possibly allied to the Pelargidæ through the Flamingoes, and to the Rallidæ through the Screamers (*Palamedea*). Sclater elevates them to the rank of an order, which he places on the one hand next to the Screamers, through which he connects them, by means of the Flamingoes, with the Storks; but on the other his system breaks down, and he begins a new series with the Pigeons. Forbes associated the Ducks with the Grebes and the Divers. Gadow regards the Ducks and their allies as the comparatively slightly modified descendants of the same group of which the Penguins, the Pelicans, the Divers, and the Grebes are highly specialized forms.

The arrangement of the palatal bones of the Anatidæ induced Huxley to place them at the head of his Desmognathous series, followed by the Flamingoes, the Herons and their allies, and the Pelicans and their allies. The rest of the desmognathous birds, the Birds of Prey, the Owls, the Parrots, and most of the Picarian birds appear to belong to a different series. Nitzsch states that the form of the feather-tracts in this family follows a very definite type. There is only one notch on each side of the posterior margin of the sternum. As might be expected from the similarity of their habits, the Ducks and their allies in their myology present points of resemblance to the Grebes and the Divers.

The most important external characters of the Anatidæ are their short legs, webbed feet, and laminated bill.

This family includes about 160 species, and may be subdivided into about a dozen genera, though some of the latter are of very doubtful validity. It may be regarded as almost cosmopolitan in its range, though it is almost solely represented in the tropics by winter migrants.

The following key to the British genera may be useful:—

a. Sexes alike or nearly so. One moult only, in autumn.

Lores naked	Cygnus	Tarsus not scutellated in front, but reticulated all round.
Tarsus longer than middle toe	Anser, Tadorna	

b. Sexes generally differently coloured. In addition to annual autumnal moult, the males moult in summer almost into female plumage.

Hind toe with a well-developed membrane	Anas, Fuligula, Somateria, Mergus	Bill narrow. Lamellæ developed into prominent teeth.

The birds in the genus *Tadorna* may be further distinguished from those in *Anas* by their larger size, white shoulders, and the prevalence of chestnut in their colours. *Fuligula* and *Somateria* can only be regarded as distinct on sufferance, to prevent too great change of nomenclature: they completely intergrade; but the line may be drawn by placing all species with part of the head coloured emerald-green in the latter genus.

Genus CYGNUS.

The Swans were included by Linnæus in the genus *Anas*, and by Brisson in the genus *Anser*; but in 1803 Bechstein, in his 'Ornithologisches Taschenbuch,' ii. p. 404, established the genus *Cygnus* for their reception.

The Hooper (*C. musicus*) is unquestionably the type of the genus. Strange as it appears to us, Linnæus did not regard the Hooper as specifically distinct from the Mute Swan. He included them both under the name of *Anas cygnus*, which he divided into two subspecies, *Anas cygnus ferus* and *Anas cygnus mansuetus*, of each of which he gives a correct diagnosis. As he distinguished the former as *α* and the latter as *β*, there can be no doubt that he regarded the former as typical.

The Swans may be distinguished from both the Ducks and the Geese by having the lores bare of feathers. They may further be distinguished from the Ducks by having the front of the tarsus reticulated instead of scutellated, and from the Geese by the shortness of the tarsus, which is not so long as the middle toe. The tail is short and rounded; the wings are also somewhat rounded, the first four primaries being nearly equal in length, and the longest secondaries are long and broad, and in a state of rest project as far as the tips of the primaries.

Swans closely resemble Geese in their various changes of plumage, except that the young do not moult in their first autumn, but become much whiter by the abrasion of the grey ends of the feathers. Incubation also lasts longer, from five to almost six weeks.

There are only seven well-authenticated species of Swan—three breeding in the Palæarctic Region, two in the Nearctic, one in South Australia, and one in the southern portions of South America.

Swans are essentially aquatic birds, frequenting fresh water during the breeding-season, but occasionally visiting the sea-shore in winter. They swim and fly with great ease, but they seldom walk, and never dive. They feed principally on vegetables, but vary their diet with insects and mollusks. They build large nests on the ground, and lay several unspotted, almost white, eggs.

CYGNUS OLOR.

MUTE SWAN.

(Plate 57.)

Anser cygnus, *Briss. Orn.* vi. p. 288 (1760).
Anas cygnus, *Linn. Syst. Nat.* i. p. 194 (1766, *partim*).
Anas cygnus, β. mansuetus, *Linn. Syst. Nat.* i. p. 194 (1766).
Anas cygnus mansuetus, *Tunst. Orn. Brit.* p. 4 (1771).
Anas olor, *Gmel. Syst. Nat.* i. p. 501 (1788); **et auctorum plurimorum**—*Temminck*, (*Naumann*), (*Dresser*), (*Saunders*), &c.
Cygnus gibbus, *Bechst. Naturg. Deutschl.* iii. p. 815 (1809).
Cygnus olor (*Gmel.*), *Vieill. N. Dict. d'Hist. Nat.* ix. p. 37 (1817).
Cygnus sibilus, *Pall. Zoogr. Rosso-Asiat.* ii. p. 215 (1826).
Cygnus mansuetus (*Linn.*), *Flem. Brit. An.* p. 126 (1828).
Cygnus immutabilis, *Yarrell, Proc. Zool. Soc.* 1838, p. 19.
Cygnus olor immutabilis, *Schleg. Rev. Crit.* p. cxii (1844).
Cygnus unwini, *Hume, Ibis*, 1871, p. 413.

It would be difficult to prove that the Common Swan, often erroneously called the Mute Swan, is a British bird. It is said to have been introduced from Cyprus in the twelfth century, and is now found in a state of semidomestication on rivers, canals, lakes, ponds, and ornamental waters in most parts of our islands. It may, however, readily be believed that a bird which migrates regularly to breed in Denmark and North Germany must occasionally wander as far as our shores. Most, if not all, writers on British birds have given it the benefit of the doubt, though it has never been known to breed in a wild state in any part of Great Britain or Ireland.

The Mute Swan has a very restricted range. It is doubtful whether in a wild state it breeds west of the Rhine, and north of the Baltic it only breeds in Denmark and South Sweden, being only an accidental visitor to Norway. It is a summer visitor to South Russia, the valley of the Danube, Transylvania, and Greece, but in the basin of the Mediterranean it is principally known as a winter visitor. It is a summer visitor to the northern shores of the Caspian, to Turkestan, and to Mongolia, occasionally straying into Dauria, where it was observed by Radde. It winters in the southern portions of the Caspian, occasionally wandering into the extreme north-west of India.

In the northern portion of its range the Swan is a migratory bird, arriving at its breeding-grounds in March and leaving them again in October. It migrates in flocks or small parties, and may be seen winging its way northward in early spring during the day; but it also migrates by night, and the rush of its wings may often be heard when it is too dark to

see the birds. Its favourite resorts are large sheets of water, where it can find islands covered with brushwood or surrounded by reeds, on which it can breed secure from molestation. In winter it is more often found on the sea-shore, especially in the estuaries of rivers and in quiet secluded bays.

The Swan feeds principally upon aquatic plants, but also eats water-insects of all kinds, mollusks, and occasionally frogs.

The Swan is a very powerful bird, and well able to defend himself from any enemy that may attack him. Instances are recorded of men having had their legs or arms broken by a blow from the wing of a Swan, but, if true, it must have been under very exceptional circumstances. Natural selection does not appear ever to have been required to assist the survival of the Swan by protective coloration. Wherever a Swan is to be seen it is always the most conspicuous object in the landscape. On the lagoons of the Danube I have sometimes for a moment mistaken a flock of Swans for a patch of snow lying under the bank. It is a fine sight to see them get up one by one, and cross the bows of the boat in a long line, as they cross over to the other side of the lagoon. They fly like Herons, with their long wings stretched out, and the *swish, swish* of their wings quite startles the listener at first, and is distinctly audible when the flock must be a mile off. Unlike the Heron, however, the Swan flies with his long neck stretched out at full length, like a Goose or a Duck. Although the Swan fears no winged enemy, and is safe on the water from the attacks of quadrupeds, it has learnt, like all large birds, to be very distrustful of man. It is almost impossible to get within range of a Swan, except by lying in wait for a chance shot. The tameness of the domestic Swan allows many traits in its character to be noticed which are very difficult to be observed in the wild bird. The graceful way in which it arches its neck and puffs out its scapulars and innermost secondaries, the ease with which it swims or floats on the water with one leg tucked up behind the wing, and its occasional habit of swimming with one or two of its young nestled in the hollow of its back, are all well known.

Swans probably seldom breed until they are two years old or more. In the valley of the Lower Danube I have seen large flocks of Swans consisting of several hundred birds during the first half of June; at the same time pairs of Swans were to be found in the more retired parts of the flooded country.

The nests of the wild Swan which Mr. Benson showed me in the Thiergarten near Copenhagen were large structures, four or five feet across and at least a couple of feet high, composed of old reeds, dead grass, and other herbage. The nests are built in the shallow water in the lakes on the domain, and the same nest is repaired year after year. Four pairs, presumably the same birds, for the Swan is said to pair for life, arrive every

spring, possibly from their winter-quarters in the Mediterranean. Occasionally other pairs arrive and attempt to seize the old nests, when a battle royal takes place. These fights are sometimes so furious that the white plumage of the Swans becomes stained with blood. The half-tame Swans which breed on the broads in Norfolk build similar nests, generally on an island, and often under the shelter of a willow, but it is said that they build a fresh nest every season. Wild Swans seldom have eggs before May, but tame Swans often breed much earlier, and may be seen sitting on their eggs when the ground is covered with snow. Naumann says that incubation lasts from 36 to 39 days. The number of eggs varies from five to eight. There is often very little difference in the shape of the two ends; the texture is rough, and there is scarcely any gloss. They vary in length from 4·9 to 4·3 inch, and in breadth from 3·1 to 2·8 inch. They may always be distinguished from eggs of the other British Swans by their greenish-white colour.

Compared with the Hooper Swan the Mute Swan is a silent bird, but when angry it hisses like a goose, and in pairing-time it has a few low not unmusical notes. Both the elder and the younger Naumann state that this Swan in a wild state at its breeding-grounds has a loud trumpet-like note, like that of the Crane or the Hooper.

The adult Mute Swan has the entire plumage pure white. The lores, frontal tubercle, the base of the upper mandible, the nostrils, the nail, the edges of the upper mandible, and the whole of the under mandible black, remainder reddish orange; legs and feet dull black; irides hazel. Young in first plumage are almost uniform greyish brown, the feathers being white with brown tips, which gradually abrade to almost white in the course of the following spring and summer. Bill greyish black, the frontal tubercle only slightly indicated; legs and feet pale lead-colour. After their first moult (when they are about a year old) the fully adult plumage is assumed, the only signs of immaturity being the smaller frontal tubercle and the replacement of the orange-red portion of the bill by flesh-colour.

As long ago as 1838 Yarrell described what he regarded as a new species of Swan (Proc. Zool. Soc. 1838, p. 19), under the name of *Cygnus immutabilis*. It was supposed to differ from the common species in having when adult a smaller knob at the base of the bill, slate-grey instead of black legs, and when young in having the bill flesh-colour instead of greyish black, and the plumage of the upper parts pure white without brown ends to the feathers. It has been called the Polish Swan under the mistaken impression that it was a native of that country. As a matter of fact it appears to be confined to the British Islands, the only instance of its having occurred elsewhere being a single example obtained on the Lake of Haarlem, in Holland, in December 1840. It has never been known to breed except in a state of domestication, and the few examples which have been

obtained in this country in an apparently wild state have probably been escaped birds. It appears to me that the so-called Polish Swan can only be regarded as a quasi-albino produced by domestication, probably from the same causes that have originated the white varieties of the domestic Duck and the Goose. The size of the frontal tubercle is principally a question of age; the difference in colour of the bill of the two forms seems to have been greatly exaggerated, and many examples of the Hooper in first plumage fade into almost white by the abrasion of the grey tips of the feathers.

MUTE SWAN.

CYGNUS MUSICUS.

HOOPER SWAN.

(Plate 57.)

Anser cygnus ferus, *Briss. Orn.* vi. p. 292 (1760).
Anas cygnus, *Linn. Syst. Nat.* i. p. 194 (1766, *partim*).
Anas cygnus, *α.* ferus, *Linn. Syst. Nat.* i. p. 194 (1766).
Cygnus musicus, *Bechst. Naturg. Deutschl.* iii. p. 830 (1809); **et auctorum plurimorum**—*Temminck, Bonaparte, Macgillivray, Dresser, Saunders*, &c.
Cygnus melanorhynchus, *Meyer, Taschenb.* ii. p. 498 (1810).
Cygnus ferus (*Briss.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 37 (1816).
Cygnus islandicus, *Brehm, Vög. Deutschl.* p. 832 (1831).
Olor musicus (*Bechst.*), *Wagl. Isis*, 1832, p. 1234.
Cygnus xanthorhinus, *Naum. Vög. Deutschl.* xi. p. 478 (1842).

The Hooper (a name which some modern ornithologists with more wit than wisdom have tried to correct into Whooper) is variously known as the Wild Swan, the Whistling Swan, or the Whooping Swan, but it is a pity to alter a name which has been familiar to every ornithologist and sportsman for at least two hundred years, from the days of Willughby down to the present time *.

The Hooper is a tolerably common winter visitor to the coasts of the British Islands. It appears only to pass the Shetlands on migration, but is a winter visitor to the Orkneys, where it is said by Low to have formerly bred. It is a well-known winter visitor to the Hebrides and the Scotch coasts generally, being most abundant in severe seasons; whilst the same remarks apply to England and Ireland. It occasionally visits the Channel Islands in hard winters.

The Hooper appears to be confined to the Old World, where it breeds principally north of the Arctic circle. It is a common resident in Iceland, whence it occasionally strays as far as Greenland, where it has been exterminated by the natives; it is also now only seen in the Faroes on migration, but still breeds throughout Arctic Europe, wandering southwards in winter to both shores of the Mediterranean and Black Seas, and occasionally appearing on many inland lakes and rivers on migration. In Arctic Asia its place is partly taken by a smaller ally, Bewick's Swan. Mid-

* The derivations of the words "Hooper" and "Hoopoe" are, like that of the word "hooping-cough," onomatopœtic. The French *Huppe* is derived from the Greek ἔποψ, through the Latin *upupa*—a fact which the revolutionary ornithological nomenclators, who pride themselves upon being *les plus huppés*, may do well to ponder.

dendorff found it breeding on the Taimur peninsula, and it probably breeds as far east as Behring Straits, as it passes through Southern Siberia and Mongolia on migration, and is not uncommon during winter in Japan and on the coasts of China, where it has been found as far south as the mouth of the Yan-tsze-kiang. It passes through Turkestan on migration to winter in the basin of the Caspian, and is said to have occurred in Nepal. It has no nearer ally than Bewick's Swan.

The Hooper frequents exactly the same kind of country as its congener the Mute Swan, but its breeding-grounds are situated a thousand miles further to the north. It is doubtful whether it has ever been found breeding south of lat. 62° in Finland, and the Arctic circle is said to be its southern breeding-range in Scandinavia as in East Russia.

When Harvie-Brown and I were in the valley of the Petchora, waiting at Ust Zylma, a little south of the Arctic circle, for summer to come, one of the first warnings that we had of the approaching break-up of the winter was the arrival of the Swans. At first they arrived in pairs. The earliest date was on the 11th of May; every day the numbers passing over increased, and occasionally we saw them on the snow or on the ice; until, on the 20th, when the ice on the river broke up, the last Swan appeared to have passed us, and we saw no more of them until we arrived at their breeding-grounds. A month later, when we had reached the tundra, where a few small birches and willows was all that was left of forest-growth, we came upon the breeding-ground of the Swans in the delta of the Petchora. We found several nests between the 19th and 30th of June; they were large structures composed of dead sedge and coarse herbage, and concealed in the dense willow-scrub that covered most of the islands. The number of eggs varied from two to four, but in Iceland five is the usual clutch, and seven are occasionally found. The Hooper is a very shy bird; we never got a chance of a shot, except once or twice from a boat. We saw very little of it on the tundra, the lakes probably not producing the particular water-plants which formed its favourite food; but it was very common on the islands in the delta, and was especially fond of the "Kourias," long reaches of water running inland for some little distance and often fringed with willows. Most of the islands in the delta are under water for a few days when the river is at its highest, but they are nevertheless generally covered with low willow trees, and very often in the middle of an island there is a little lake. By cautiously stealing up to these lakes under cover of the willows we frequently obtained the most charming glimpses of happy families of Swans and half a dozen different species of Ducks feeding in delightful security. The Hooper is a ten times handsomer bird than a tame Swan in the eyes of an ornithologist, but it is not really so graceful: its neck is shorter, and its scapulars are not so plume-like. Instead of sailing about with

its long neck curved into the shape of the letter S and bent back almost to the fluffed-up scapulars, the Hooper seemed intent on feeding with his head and neck under water. At the slightest noise the neck was raised erect, and the head turned round from side to side like a weathercock on a steeple. Even in July the Hoopers were not always single or in pairs, and we frequently saw half a dozen swimming together or preening their feathers on a sand-bank. We sometimes tried to drift silently down stream within gunshot of some of these small parties or herds, as they are called in the technical language of the sportsman; but they were too many for us, and rose with a tremendous splash, their wings beating the water for twenty or thirty yards before they got sufficient way on to be able to rise high enough. When once on the wing they flew with great speed, with steady beats of their long powerful wings.

On migration the Hooper is a very gregarious bird, and by far the greater number which passed us in the valley of the Yenesay on the way north were in herds, which generally flew in a wedge-shaped line; they were soon out of sight, but sometimes passed over us at a great height. Many a time whilst struggling with snow-shoes on the treacherous half-melting snow in the forest I have heard their trumpet calls without being able to catch a glimpse of them between the trees. The notes of the Hooper are like the bass notes of a trombone, and sometimes almost set your ear on edge; but they are very short, three or four trumpet-blasts keeping time with the upward and downward strokes of the wing. It is not known that the food of the Hooper differs from that of its more southern ally; it consists chiefly of aquatic plants, water-insects, and mollusks.

The eggs of the Hooper agree with those of Bewick's Swan in being creamy white in colour and in having a slight gloss; like those of the Mute Swan, also, the surface is granulated, and there is very little difference in the shape of the two ends. They vary in length from 4·7 to 4·2 inch, and in breadth from 2·9 to 2·65 inch. Eggs of the Mute Swan may at once be distinguished by their slightly greenish colour; but eggs of Bewick's Swan can only be distinguished by their smaller bulk. In length the eggs of the two species overlap, but short eggs of the Hooper are "short and stout," and long eggs of Bewick's Swan are "tall and thin," so that they cannot be confused, except in abnormal cases, which may possibly occur. The safest guide in the determination of the eggs of these two species of Swan is that of weight. Eggs of the Hooper weigh considerably more, and those of Bewick's Swan considerably less, than four sovereigns.

The extermination of the Hooper in so many of its breeding-places has arisen from an unfortunate habit, which it evidently acquired ages ago, before man came upon the scene—a habit which it shares with the Geese.

Most birds moult their quills slowly, in pairs, so that they are only slightly inconvenienced by the operation, and are never without quills enough to enable them to fly. Swans and Geese, on the other hand, drop nearly all their flight-feathers at once, and for a week or two before the new feathers have grown are quite unable to fly. In some localities the Hoopers have had the misfortune to breed where the natives have been clever enough to surround them at this critical period of their lives, and stupid enough to avail themselves of the opportunity thus afforded of killing the geese that laid the golden eggs.

The adult Hooper Swan has the entire plumage pure white. Lores and basal portion of bill, extending below the nostrils, deep yellow, remainder black; legs and feet dull black; irides hazel. Young in first plumage are pale brownish grey; the shoulder-feathers and those of the lower back and rump are white, with narrow brown margins, and the axillaries are snow-white; the basal portion of the bill is flesh-colour instead of deep yellow. Legs and feet reddish black. After the first autumn moult, when the birds are about a year old, the only sign of immaturity is the pale yellow instead of deep yellow basal portion of the bill.

HOOPER'S NEST.

CYGNUS BEWICKI.

BEWICK'S SWAN.

(Plate 58.)

Cygnus olor, β. minor, *Pall. Zoogr. Rosso-Asiat.* ii. p. 214 (1826).
Cygnus bewickii, *Yarrell, Trans. Linn. Soc.* xvi. p. 453 (1833); **et auctorum plurimorum**—*Temminck, Macgillivray, Bonaparte, Dresser, Saunders, &c.*
Cygnus minor (*Pall.*), *Keys. & Blas. Wirb. Eur.* p. lxxxii (1840).
Cygnus melanorhinus, *Naum. Vög. Deutschl.* xi. p. 497 (1842).
Cygnus musicus minor (*Pall.*), *Schleg. Rev. Crit.* p. cxii (1844).
Olor minor (*Pall.*), *Bonap. Cat. Parzud.* p. 15 (1856).
Cygnus altumii, *Baed. fide Schleg. Mus. Pays-Bas, Anseres,* p. 82 (1866).

Bewick's Swan was discovered by Pallas nearly a century ago, but was regarded by the great Siberian traveller as only a small race of the Hooper. Naumann claims to have rediscovered it early in 1823 in Germany; Yarrell a year later in the south of England; and Hancock in January 1829 in the north of England.

Since Yarrell's discovery, Bewick's Swan has been found to be a by no means uncommon winter visitor to the coasts of Scotland and England, including the Outer Hebrides, the Orkneys, and Shetlands, and possibly the Channel Islands. It is, however, most abundant on the west coast of Ireland, where it is sometimes observed in thousands during frosty weather, but is also frequently met with on almost all parts of the coast of that country. Bewick's Swan often visits water far from the coast, especially in severe seasons.

So far as is known, the breeding-grounds of Bewick's Swan are confined to the tundras above the limits of forest-growth east of the White Sea, in the lower valleys of the Petchora, the Obb, the Yenesay, and the Lena, and on the islands in the Arctic Ocean near these limits. It is not known to breed in Lapland, and has only once occurred on the Scandinavian peninsula, whilst Nördenskiold's party in the 'Vega' did not observe any species of Swan amongst the flocks of migratory birds which arrived as soon as the ice began to break up. It migrates down the great rivers, and passes through Turkestan, South Siberia, and Mongolia on migration to winter in the Caspian, and on the coasts of Japan and China as far south as the mouth of the Yan-tsze-kiang. Occasionally examples wander as far as the coasts of Denmark, Holland, and France, and a solitary example has been obtained in Nepal. Bewick's Swan has no nearer ally than the Hooper.

There is nothing very remarkable in the fact that Bewick's Swan should be so much more abundant on the west coasts of Scotland and Ireland than

on the east coasts of Scotland and England. The estuaries, fjords, lochs, and inland lakes of the west provide it with tempting feeding-grounds, to say nothing of the comparative freedom from the persecution which it encounters in a more thickly populated country. The mystery lies in the fact that Bewick's Swan should be found at all on our coasts. It has never been found breeding in Iceland, Lapland, or Finland. Nine examples only are recorded from Norway. It is very rare in the Baltic, which is apparently only visited by a few stragglers from the delta of the Dwina. The Bewick's Swans breeding in the deltas of the Petchora, the Obi, and the Yenesay arrive from the south, no doubt from the Caspian and Japanese Seas. We are consequently driven to the conclusion that the Swans which are known to breed in great numbers on the islands of Nova Zembla and Kolguev, and the species of which have not yet been determined, are Bewick's Swans, which migrate east in autumn, give the shores of Norway a wide berth, and drop down to winter on the western coasts of our islands.

The first Swan which ventured as far north as the Arctic circle, in the valley of the Yenesay, during the weary months when Capt. Wiggins and I were waiting for the arrival of summer, was seen on the 5th of May. It is probable, however, that this pioneer soon returned to the south, as we saw nothing more of them for some weeks. On the 9th Geese began to arrive, after the 16th in considerable numbers; but we saw no more Swans until the 28th, when many flocks passed over. During the next fortnight hundreds of large and small flocks winged their way over our heads, after which we saw no more of them until we got down to the delta. They are quite as noisy as their allies, and are constantly calling to each other as they fly over, but their notes are not so harsh. I call it a musical bark; Naumann expresses it as *klung*; and Sir Ralph Payne-Gallwey as *tong*, "musical and quickly uttered."

Bewick's Swan is quite as shy and difficult of approach as its ally; but there is not the slightest necessity to shoot the handsome bird in order to identify the species. It is fond of walking and standing on the mud or sand on the banks of the rivers and lakes where it feeds. All that is necessary is to mark down the place, find the heavy footprints and measure them. The impress of the middle toe of Bewick's Swan from the centre of the ball of the heel to the centre of the ball next the claw measures five inches and a quarter; the footprints left by the Hooper measure an inch or more longer.

Bewick's Swan scarcely differs from its ally in its habits, food, or in its choice of feeding- or breeding-grounds. It probably breeds further north and not so far south; but there seems to be some doubt which species Middendorff found on the Taimur peninsula. Our trusty Samoyade servant in the Petchora brought us a Bewick's Swan which he had shot

from a herd of nine as they were swimming near the edge of a large lake. He succeeded in stalking up to within thirty paces of them, when they caught the alarm, immediately swam close up together, pausing for a moment to listen with upstretched necks. St. John describes the same habit of the Hooper in the north of Scotland.

The first identified eggs of Bewick's Swan were those obtained by Harvie-Brown and myself in the delta of the Petchora. A Russian fisherman took the two eggs and trapped the bird on the nest. He sold us the eggs, and we afterwards bought the bird from his mate to whom it had fallen as his share of the plunder.

I have never actually seen the nest of Bewick's Swan, but I have had it described to me by four independent witnesses. The Russian fisherman who obtained the eggs for us on the island of Pyonin, in the delta of the Petchora; Mr. Nummelin (whose portrait may be found in the 'Voyage of the Vega,' i. p. 316), who got for me three eggs on the island of Brekoffsky, in the delta of the Yenesay, and one from Tolstanos on the mainland; the Samoyade who collected for me at Golcheeka; and the German exile Ulemann, who had lived many years at Vershinsky, and used to go down to the delta of the Yenesay every summer to fish, and was, moreover, quite a naturalist—all assured me that Bewick's Swan built a nest in the same kind of situation and of the same materials as the nests of the Hooper which I had seen. The eggs are smaller than those of the Hooper, and are probably the same in number, but I have never seen a larger clutch than three. They do not differ from those of the Hooper in any other respect, unless, perhaps, they may be slightly less glossy. They vary in length from 4·3 to 3·8 inch, and in breadth from 2·65 to 2·55 inch. (Dresser's alleged egg measuring 3·3 inch by 2·4 inch is probably that of a Goose.) They may be distinguished from eggs of the Hooper by their weight, details of which may be found on page 482.

The adult Bewick's Swan has the entire plumage pure white. Lores and basal portion of the bill, but not extending below the nostrils, deep yellow, remainder black; legs and feet dull black; irides hazel. Young in first plumage resemble those of the Hooper. After the first moult, when they are about a year old, they can only be distinguished from adults by the pale colour of the basal portion of the bill.

The Trumpeter Swan, *Cygnus buccinator*, has been added to the list of British birds. Four examples are said to have been killed near Aldeburgh, in Suffolk, in October 1866, but no evidence of any kind has been brought forward to prove that they really belong to this species. On the contrary the sternum of one of the four has authoritatively been pronounced to be that of a Mute Swan, of which species they were all probably immature examples. The Trumpeter Swan is an American bird, breeding in the arctic regions of that continent and as far south as lat. 42°. It may be

recognized by its entirely black bill. It has bred freely in the Zoological Gardens in Regent's Park.

A second American species, *C. americanus*, having a very similar range, and differing principally from the Trumpeter Swan in being smaller, has possibly greater claims to be regarded as British. In February 1841 Macgillivray (Hist. Brit. B. iv. p. 675) obtained one, and in December 1879 Mr. Charles A. Parker (Zoologist, 1880, p. 111) found five wild Swans in a poulterer's shop in Edinburgh. Macgillivray's example was that of an immature bird, but Parker's were said to be adults, and in both cases the result of dissection was supposed to be in favour of their being examples of the American Swan. Further examination has, however, thrown some doubt on the correctness of the diagnosis.

HOOPER.

BEWICK'S SWAN.

Genus ANSER.

The Geese were included by Linnæus with the Swans and the Ducks in the genus *Anas*, both in the tenth edition of the 'Systema Naturæ,' published in 1758, and in the twelfth edition of the same work published in 1766. In Brisson's 'Ornithologia,' which appeared in the meantime (in 1760), the genus *Anas* is split into two genera, *Anser* and *Anas*, the former including the Swans, Geese, Eider Duck, and Muscovy Duck, and the latter the smaller Ducks. Bechstein appears to be the first ornithologist who restricted the genus *Anser* to the Geese. In his 'Ornithologisches Taschenbuch,' ii. p. 404, published in 1803, the characters of the restricted genus are described. The Grey-lag Goose, *A. cinereus*, being the *Anas anser* of Linnæus, is the type.

The Geese resemble the Swans, but differ from the Ducks in having the tarsus covered in front as well as at the back and sides with small hexagonal reticulations. From the Swans they are distinguished by their longer legs, shorter necks, and feathered lores.

Geese resemble Swans and differ from most of the Ducks not merely in the fact that they only moult once in the year, so that the summer and winter plumage are similar, but also in the peculiarity that there is little or no difference in the colour of the plumage of the two sexes. Geese pair for life, and although the gander does not assist in incubation, he takes an active part in the care and defence of the young. Incubation lasts about four weeks; the young are born covered with down, and are able to run and swim a few hours afterwards. After about six weeks the wing- and tail-feathers begin to appear, and in a few weeks more they have completed their first plumage and are able to fly. In September their first moult begins, and proceeds slowly until December, when they are in the plumage of birds of the year, which only differs from that of the adult in some of the feathers, especially the wing-coverts, retaining signs of immaturity by having pale margins, and in the fact that the quill-feathers and most or all of the tail-feathers are not moulted until the second autumn, when the bird is rather more than a year old. As might be expected, Geese in the plumage of birds of the year (having, as already stated, the quills and most or all of the tail-feathers of their first plumage) are not capable of breeding, and they do not pass through their second autumn moult until a month later than the adults. The second moult, however, does not last three months as the first did, but, like that of adults, it is over in a month. Adults begin to moult before the young can fly, in the high north before the down has disappeared; the small feathers are

changed first, and the quills are moulted last of all, and all at once, so that for some time the poor birds are entirely unable to fly and are as helpless as their young.

The genus *Anser* contains about thirty species, which are distributed in most parts of the world except in the tropics. Twenty of them breed in the Arctic Region, eight on the confines of the Antarctic Region (six in South America, and two in South Australia); and of the remaining two, one is a resident in the Sandwich Islands, and the other on the plateaus of Abyssinia, ten thousand feet above the sea.

Geese are for the most part land-birds during the breeding-season, and water-birds in winter, but many species spend most of the year away from the sea. They walk very rapidly, though not very gracefully; they fly swiftly, but with apparent labour; and they swim and occasionally dive with ease. Their cries are not very loud, and have no pretensions to be musical. They are very gregarious, except whilst incubation is going on, and breed on the ground, making clumsy nests, which they line with their own down, laying creamy-white eggs.

The British Geese may be distinguished as follows:—

- Snow-Goose.
- Bill yellow with dark base and tip:
  - Bean-Goose.
  - Pink-footed Goose
- Black bars on belly:
  - Grey-lag Goose
  - White-fronted Goose.

(Legs and feet flesh-coloured.)

- Black throat and breast:
  - Bernacle Goose.
  - Brent Goose
- Chestnut throat and breast: Red-necked Goose

(Black forehead.)

ANSER HYPERBOREUS AND ANSER HYPERBOREUS NIVALIS.

LESSER SNOW-GOOSE and SNOW-GOOSE.

(PLATE 61.)

As is also the case with many other species of this genus, there appear to be a larger and a smaller race of the Snow-Goose having more or less distinct geographical ranges. The dimensions of the two races are as follows :—

	Wing.	Bill.
Anser nivalis . .	17 to 18½ inches.	2·38 to 2·65 inch.
Anser hyperboreus.	15 to 17½ „	1·95 to 2·28 „

The examples which have been obtained in our islands are said to belong to the smaller race, although the geographical distribution of the species appears somewhat at variance with the fact. The synonymy of the two races is as follows :—

ANSER HYPERBOREUS.

LESSER SNOW-GOOSE.

Anser hyperboreus, *Pall. Spicil. Zool.* vi. p. 25 (1769); **et auctorum plurimorum** —(*Temminck*), (*Degland & Gerbe*), (*Baird, Brewer, & Ridgway*), (*Saunders*), &c.
Anas hyperboreus (*Pall.*), *Gmel. Syst. Nat.* i. p. 504 (1788).
Chen hyperborea (*Pall.*), *Boie, Isis*, 1822, p. 563.
Anser albatus, *Cass. Proc. Ac. Nat. Sc. Philad.* 1856, p. 41.
Chen albatus (*Cass.*), *Elliot, New & Unfig. B. N. Amer.* ii. pl. 42 (1869).
Anser hyperboreus, *var.* albatus (*Cass.*), *Coues, Key N.-Amer. B.* p. 282 (1872).
Chen hyperboreus albatus (*Cass.*), *Ridgway, Proc. U.S. Nat. Mus.* 1880, p. 202.

ANSER HYPERBOREUS NIVALIS.

SNOW-GOOSE.

Anser niveus, *Briss. Orn.* vi. p. 288 (1760).
Anas nivalis, *Forst. Phil. Trans.* lxii. p. 413 (1772); **et auctorum plurimorum**— (*Baird, Brewer, & Ridgway*), &c.
Tadorna nivea (*Briss.*), *Brehm, Vög. Deutschl.* p. 854 (1831).
Anser hyperboreus, *apud Dresser, Coues*, &c.

The Snow-Goose (whether of the large or small race is not yet satisfactorily determined) is probably a more frequent visitor to the British Islands than is generally supposed. As is the case with several other American species, it has only hitherto been captured in Ireland, although it is said that a Snow-Goose was seen in the autumn of 1884 off the coast of Cumberland. This interesting species was first made known as a visitor to the

British Islands by Mr. Howard Saunders, who purchased in Leadenhall Market, on the 9th of November 1871, two immature examples which had been shot a few days before on the Lake of Tacumshane, on the south coast of co. Wexford. On inquiry being made into the circumstances of the capture, it was further elicited that a third example had been shot, but had not been preserved (Saunders, Proc. Zool. Soc. 1872, p. 519). Five years later a flock of seven Snow-Geese was seen on some marshy ground in Termoncarra, in the Barony of Erris, co. Mayo, about the end of October, of which one was shot and another, a male, was trapped (Harting, 'Zoologist, 1878, p. 419). The latter bird eventually paired with a Common Goose and brought up a brood. Upon the death of this bird it was stuffed, and is the subject from which the drawing in the fourth edition of Yarrell's 'British Birds' was made. It is said that two Snow-Geese which had been kept with a flock of tame Geese in Ireland were afterwards placed in Lord Derby's Aviary at Knowsley, and were sold by auction in 1851 to Mr. Castang, the well-known bird-dealer; but there is not sufficient evidence to show that the birds had not been imported.

The larger race of Snow-Goose is at present only known to breed in Hudson's Bay Territory; but as flocks have been seen on migration and individuals occasionally obtained both in North Europe and in Siberia, it seems probable that it may breed on some of the islands in the Arctic Ocean near those continents. It winters in the United States as far south as Texas, and several examples are recorded from the Bermudas. It is an occasional straggler to Greenland, and migratory parties or flocks not unfrequently occur in various parts of the Palæarctic Region from the Atlantic to the Pacific. It is seen more or less regularly in Russia and Japan; but elsewhere its occurrence appears to be exceptional. The smaller race is only known to breed in the Arctic regions of North-west America, migrating southwards in winter as far as California and the valley of the Mississippi; but as all the British examples appear to belong to this race, its breeding-range is probably much more extensive. The fact that small birds are seen in the flocks of Snow-Geese in Japan suggests the probability that both forms breed in Siberia.

During the breeding-season the Snow-Goose is exclusively an Arctic bird, frequenting the tundras above the limit of forest-growth, feeding on the grass that grows on the margins of the rivers and lakes, and on the berries of the various ground-fruits which are preserved during the winter under the snow. They probably vary this diet with mollusks and water-insects. MacFarlane found their nests on an island on the shores of the Arctic Ocean near the mouth of the Anderson River. The nests were mere hollows in the sandy soil, plentifully lined with down and probably with dead grass. The colour of the eggs is described as of a uniform dirty chalky white, and the size as averaging 3·4 inch in length and 2·2 inch in

breadth. On spring migration they pass through Alaska during the last half of May, returning in autumn during the last half of September. Audubon says that they arrive at their winter-quarters in Kentucky in October, and especially remarks that the young birds arrived early in the month, and the adult or white birds about a fortnight later. In its habits it differs very little from the Grey-lag or Bean-Goose.

The large and small forms of the Snow-Goose are respectively about the same size as the large and small forms of the Bean-Goose. It is not known that there is any difference in colour between the sexes. Adults are pure white, except the primaries, which are black, shading into grey at the base, and the primary-coverts, which are grey. Bill light red; legs and feet dark red; irides hazel. Very little is known of the changes of plumage in this species; but young in first plumage are pale slate-grey on the head, neck, back, and breast; the scapulars and wing-coverts are darker grey with pale edges, and the rest of the plumage is white; bill, legs, and feet olive-brown.

SNOW-GOOSE.

ANSER SEGETUM.

BEAN-GOOSE.

(Plate 58.)

Anser sylvestris, *Briss. Orn.* vi. p. 265 (1760).
Anas fabalis, *Lath. Gen. Syn. Suppl.* i. p. 297 (1787).
Anas segetum, *Gmel. Syst. Nat.* i. p. 512 (1788); **et auctorum plurimorum—** *Temminck*, (*Macgillivray*), (*Yarrell*), (*Dresser*), (*Saunders*), &c.
Anser segetum (*Gmel.*), *Meyer*, *Taschenb.* ii. p. 554 (1810).
Anser platyuros, Anser arvensis, *Brehm*, *Vög. Deutschl.* pp. 837, 839 (1831).
Anas paludosus, *Strickl. Ann. & Mag. Nat. Hist.* series 3, iii. p. 124, pl. 4. fig. 1 (1859).

The Bean-Goose is a common visitor to the British Islands on spring and autumn migration, and great numbers remain to winter on our shores. It is a well-known bird on most parts of the English, Scotch, and Irish coasts, but is said only to be a straggler to the Orkney and Shetland Islands, though abundant in the Hebrides. There seems to be no evidence that it has ever bred in any part of the British Islands.

The Bean-Goose is a more northerly species than the Grey-lag Goose. It is an accidental visitor to Iceland, and in Scandinavia is not known to breed south of lat. 64°. In North Russia it breeds near Archangel, and in the valley of the Petchora above the limits of forest-growth. More than one traveller has obtained it on Nova Zembla. In the valley of the Yenesay it breeds above the limit of forest-growth on the Arctic tundras and on the mountains round Lake Baikal. In Eastern Siberia it breeds on the Stanavoi Mountains, and on the tundras as far north as land extends. In winter it migrates in enormous numbers to Southern Europe, where it frequents both shores of the Mediterranean (except that it has not occurred in North-east Africa); and it is extremely abundant at that season in South Russia, the basin of the Caspian, and North-east Turkestan. In mild seasons it winters on the coasts of Denmark, France, and Spain, and has been known to occur as far south as Madeira. To the east it migrates through Mongolia and the valley of the Amoor, to winter in Japan and China, but is not known to have occurred in India.

East-Siberian birds are, as a rule, larger than western examples, and may be regarded as subspecifically distinct under the name of *Anser segetum*

serrirostris *. The eastern form is specially remarkable for its large bill and feet, the former measuring from the frontal feathers to the tip from 1·7 to 2·5 inch in western examples, and from 2·4 to 3·4 inch in eastern examples. The colour of the head and neck of the eastern form is generally buffish brown, whilst that of the western form is brownish grey.

The habits of the Bean-Goose differ much less than might be expected from those of the Grey Goose when we consider that the former is a winter visitor to many places in which the latter is only known during the breeding-season. The Bean-Goose is not only a smaller bird, but it is also a bird of more rapid and powerful flight; nevertheless it is still more shy, and takes even greater care to avoid danger. It is quite as gregarious as its congener, some of the flocks which come over in autumn being of enormous size. It does not differ in its food, being entirely a vegetable-eater, and especially fond, during its winter sojourn with us, of frequenting the stubble-fields. Its various notes closely resemble those of the Grey Goose, and it frequents the same kind of localities both in the breeding-season and in winter.

Though it breeds far away in the high north beyond the Arctic circle, it is quite as anxious to reach its summer-quarters as the Grey Goose is. On its spring migration it hangs on the outskirts of the frost, ever ready to press forwards and occupy any patch of open water that may be found, and continually being driven back when the north wind gets the upper hand for a day or two and freezes up its supplies. Both in the valleys of the Petchora and the Yenesay I had ample opportunities of watching its movements. The first arrivals of adventurous, not to say rash, birds appear in small parties. In European Siberia the first announcement of the Bean-Goose was a solitary bird on the 10th of May, but east of the Urals I saw the first on the 9th of May. Several small flocks passed our winter-quarters during the next fortnight, but on the 23rd the wind changed again to the north. Every patch of open water was frozen hard, and during the 24th and 25th all the flocks we saw were flying south. Then came the grand crash on the 1st of June—the ice on the Koorayika was broken up for the season, and that on the great river south of its junction with its smaller tributary became a mass of pack-ice and ice-floes, whilst to the north the level of the water had risen so much that, as far as the eye could reach, open water could be discerned on each side of the main

* The synonymy of the eastern form is as follows:—

Anser segetum, *var.* serrirostris, *Swinhoe, Proc. Zool. Soc.* 1871, p. 417.
Anser middendorffi, *Severtzow, Turkest. Jevotn.* pp. 70, 149 (1873).
Anser grandis, *Gmel. apud Middendorff, Schrenck, Radde,* &c.

This bird must not be confounded with *Anser cygnoides* (of which *Anser grandis* is probably the young), a perfectly distinct species, with a black bill, a broad, sharply defined, dark-brown band along the back of the neck, and flesh-coloured legs and feet.

ice-sheet. The migrations of Bean-Geese set in in earnest, flock after flock followed every few minutes, winging their way northwards at a great speed. At first the flocks which passed over flew at a considerable height, apparently anxious to see as far ahead as possible, and careful not to miss any open water that might be visible at a distance; but when the thaw had commenced, they flew low, many skimming over the surface of the snow on the ice of the river, below the level of the forests, but most of them hugging the shore-line. I discovered a niche in the mud-cliffs where it was easy to lie concealed; but the Geese came tearing down like the wind upon me, as Grouse in a drive, so that before the rush of their wings had penetrated the ear they were out of shot beyond me. A good shot might have made a great bag, but after dropping one out of a small flock which passed at my side I gave up the sport, having identified the species, and being anxious not to lose the chance of securing other species of birds which were constantly arriving on the bare ground near our winter-quarters. Few scenes are more exciting than the great rush of migration which takes place, as soon as the south wind has vanquished winter for the season, in these northern latitudes. The great number of birds which are continually passing, the new species constantly arriving, the cries of many of the birds as they pass over, the march backwards and forwards of thousands of acres of pack-ice and ice-floes, the budding of the spring flowers one by one on the bare slopes of the river-banks where the snow has melted away, all combine to form a picture which is indelibly engraven on the memory of every one who has been fortunate enough to witness the scene.

The Bean-Goose is an early breeder, beginning to make its rude nest almost before the snow is melted, early in June. The islands in the delta where we found the Swans breeding have no charms for the Geese, for the sufficient reason that when the Geese begin to breed the islands are under water with thousands of acres of pack-ice and ice-floes marching over them. The Bean-Goose repairs to the lakes on the tundra, and chooses a hillock on the bank or an islet in the lake itself where the rushes and sedge are tall enough to conceal the sitting bird. A slight hollow is scraped in the soil and lined with dead grass, moss, sometimes a few feathers, and always plenty of the light grey down of the bird itself. The number of eggs was generally three, but often four. They are creamy white in colour, with a rough granular texture and very little gloss. They are almost always decidedly more rounded at one end than at the other. They vary in length from 3·4 to 3·0 inch, and in breadth from 2·2 to 2·1 inch. The largest eggs of the Bean-Goose are as large or larger than the smallest eggs of the Grey Goose, but they may be distinguished at once by their weight. The smallest egg of the Grey Goose weighs more than two sovereigns; the largest egg of the Bean-Goose scarcely weighs a sovereign and a half.

Eggs of the Bean-Goose cannot be distinguished from those of the Pink-footed Goose or from large ones of the White-fronted Goose.

Soon after the young are hatched, before they are able to fly, these birds collect into large flocks and march slowly into the tundra to moult. The Samoyades in the valley of the Petchora gave us glowing accounts of the grand battues which they used to have at these times, surrounding the Geese, killing them with sticks, and collecting sacks full of down and feathers. I was fortunate enough to meet with one of these migratory flocks. I was walking along the banks of a river which flows into the lagoon of the Petchora, when all at once I heard the distant cackle of Geese. A bend in the river gave me an opportunity of stalking them, and when I came again in sight of the river a most extraordinary and interesting scene presented itself. At least a hundred old Geese and quite

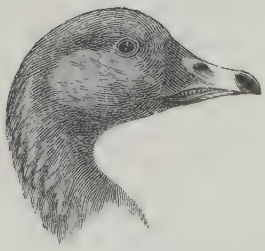
as many young, perhaps even twice or thrice that number, were marching like a regiment of soldiers. The vanguard, consisting of old birds, was half-way across the stream, whilst the goslings brought up the rear, and were running down the steep bank to the water's edge as fast as their young legs could carry them. The green grassy banks of the river where the Geese had evidently been feeding were strewn with feathers, and in five minutes I picked up a large handful of quills. They were evidently migrating to the interior of the tundra, moulting as they went along. On the following day, our stock of provisions being entirely exhausted, we sent a foraging party after this flock of Geese, who met with them a few versts higher up the river and secured eleven old birds and five goslings. Most

of the Geese were in full moult and unable to fly, and both old and young made for the water, attempting to conceal themselves by diving.

It is a remarkable fact that the Bean-Goose will seldom breed in confinement.

The western form of the Bean-Goose is rather less than the Grey Goose. The sexes do not differ in colour. Adults have the upper parts brown, suffused with grey on the wing-coverts, each feather on the mantle, scapulars, innermost secondaries, and wing-coverts having a greyish-white margin; primaries nearly black; lower back and rump uniform dark brown; upper tail-coverts and sides of rump white; quills and tail-feathers dark brown, the latter margined with white. The underparts are white, shading into brown on the throat, breast, under wing-coverts, and flanks. Bill orange, with nearly black base and tip; legs and feet orange-yellow; irides hazel.

Young in first plumage only differ from adults in being slightly paler in colour, and are suffused with buff on the head and neck. The nearest ally of the Bean-Goose is the Pink-footed Goose; no other British species has the base of the bill and the nail black.



BEAN-GOOSE.

ANSER BRACHYRHYNCHUS.

PINK-FOOTED GOOSE.

(Plate 60.)

Anser brachyrhynchus, *Baill. Mém. Soc. roy. d'ém. d'Abbev.* 1833, p. 74; **et auctorum plurimorum**—*Degland & Gerbe, Yarrell, Dresser, Saunders,* &c.
Anser phœnicopus, *Bartlett, Proc. Zool. Soc.* 1839, p. 3.

The Pink-footed Goose is a common winter visitor to the coasts of the British Islands, though it has not yet been known to visit Ireland. It is less common on the south coast of England, and does not yet appear to have been observed in the Shetland Islands.

The Pink-footed Goose can scarcely be regarded as more than a local race or an island form of the Bean-Goose, certainly breeding on Spitzbergen, most probably on Iceland*, and possibly on Franz-Josef Land. To the British Islands it is only a winter visitor, most abundant on the Outer Hebrides and on the east coast of England. To the coasts of Scandinavia, Denmark, and Holland it is a regular visitor on spring and autumn migration, and in winter it occasionally strays as far as the coasts of Belgium and France. Its reported occurrence in India cannot be accepted without more satisfactory evidence.

The attention of British ornithologists was first directed to the Pink-footed Goose by Mr. Bartlett, the present Superintendent of the Zoological Gardens in Regent's Park, as long ago as 1839; but it was afterwards found out that he had been forestalled in his discovery of this species by Mons. Baillon, of Abbeville. The specific distinction of this Goose is very doubtful; the bill is very small, compared with eastern examples of the Bean-Goose, but western examples of the latter are quite as small. The colour of the bill and feet is not constant under the influence of domestication. Mr. Cecil Smith has bred them in confinement for several seasons, and states that some of the young have orange legs and orange on the bill, whilst others have pink legs and pink on the bill, like their parents. It would perhaps be premature to degrade the Pink-footed Goose to the rank of a subspecies, and call it *Anser segetum brachyrhynchus,* on the strength of this evidence, since the effects of domestication in changing the colour of birds is well known; but it looks very much as if the Pink-

* Dresser identifies the Goose found on Nova Zembla and described by Heuglin (Journ. Orn. 1872, p. 122) as the Pink-footed Goose; but as the colour of the feet is described as brilliant orange, there can be no doubt that it was the Bean-Goose, as were also those brought from the same island by Capt. Markham.

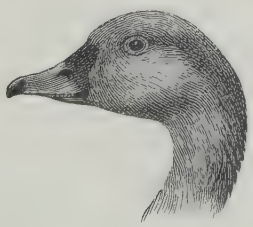
footed Geese had bred long enough in the Arctic climate of Spitzbergen to change the colour of their feet, but not long enough to make the new colour permanent, and that when bred in the warmer climate of this country they had a tendency to "hark back" to their ancestors.

With the exception of the fact that its notes are said to be sharper in tone and more rapidly repeated than those of the Bean-Goose, it is not known to differ from that bird in any of its habits. On Spitzbergen they are recorded (Evans and Sturge, 'Ibis,' 1859, p. 171) to breed "mostly on low rocks near the coast, but some seemed to have their nests in the high cliffs a mile or two from the sea." The nest and eggs do not differ from those of the Bean-Goose, but the latter may easily be distinguished from small eggs of the Grey Goose by their lighter weight*.

During their stay in this country in winter the flocks of Pink-footed Geese spend most of the day feeding on the stubbles and in the winter-corn. They are of course much persecuted and have become very wary: as soon as it begins to get dark they leave their feeding-grounds and retire to the nearest sandbank on the coast; but as soon as the moon rises, they seem to think themselves safe again, and return to the fields, where they remain until the moon sets, and the darkness warns them to seek safety again on their favourite sandbank, perhaps a mile or two from shore. They seldom, if ever, frequent the mud-flats or the salt-marshes to feed on the marine vegetation of which the Brent and the Bernacle Geese are so fond.

The Pink-footed Goose is not very closely allied to the Grey Goose (as Dresser erroneously imagines), but is so nearly related to the Bean-Goose that its specific distinction from that bird is doubtful. I know of no difference of any kind between the two forms beyond that of the colour of the legs and feet and the middle portions of the bill; these parts are pink in the Pink-footed Goose, and orange in the Bean-Goose.

* See page 495.



PINK-FOOTED GOOSE.

ANSER CINEREUS.

GREY-LAG GOOSE.

(Plate 58.)

Anser domesticus, *Briss. Orn.* vi. p. 262 (1760).
Anas anser, *Linn. Syst. Nat.* i. p. 197 (1766).
Anser cinereus, *Meyer, Taschenb.* ii. p. 552 (1810); **et auctorum plurimorum—**
Degland & Gerbe, Bonaparte, Naumann, Dresser, Saunders, &c.
Anas anser ferus, *Temm. Man. d'Orn.* p. 526 (1815).
Anser medius, *Meyer, Taschenb. Zus. u. Ber.* p. 231 (1822).
Anser ferus (*Temm.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 28 (1824).
Anser vulgaris, *Pall. Zoogr. Rosso-Asiat.* ii. p. 222 (1826).
Anser palustris, *Flem. Brit. An.* p. 126 (1828).

A hundred years ago the Grey-lag Goose bred in the fens and marshes of the eastern counties of England; but the reclamation of these extensive wastes has long since driven these birds to seek more congenial quarters. Its only breeding-places in the British Islands are in Scotland (in Ross, Sutherland, and Caithness) and on many of the Western Islands, and in Ireland on the lake at Castle Coole in co. Monaghan. On the east coast of Scotland, including the Orkneys and Shetland, the Grey-lag Goose is a rare visitor; it becomes more common in winter on the east coast of England, but is rare on the south. In Ireland it is much rarer, and is only known to breed in the above-mentioned locality.

The Grey-lag Goose is confined to the Old World; but its breeding-range extends from the Atlantic almost, if not quite, to the Pacific. It is doubtful whether it has ever occurred in Iceland, and has ceased to breed on the Faroes, though it is still found there on migration. It breeds throughout Scandinavia and Denmark, in North Russia south of the Arctic circle, in the Baltic Provinces, and in Pomerania. It has been driven from most of its breeding-grounds in North Germany, and is only known on migration in Holland, Belgium, and France, except in very mild winters. It is chiefly a winter visitor to the Spanish peninsula, but a few remain to breed. In Central Europe it is principally known on migration; but it breeds in the valley of the Danube and winters on both shores of the Mediterranean, though it has not been observed in North-east Africa. East of the Ural Mountains it breeds as far south as the Caucasus and probably Central Persia, and as far north as the Arctic circle in the valley

of the Obb; but further east it is not found north of Lake Baikal and the upper waters of the Amoor, though it breeds in Turkestan and Mongolia. It has not been found in the Lower Amoor or in Japan, but it winters in China as far south as the Yan-tsze-kiang and in North-west India.

Asiatic examples of this Goose are said to be somewhat larger than European, especially in the bill and feet, and to be more marked with black on the underparts; they have been distinguished as *Anser cinereus rubrirostris*, but a larger series is required before a definite opinion can be expressed. A male of the eastern form from Canton in my collection measures eighteen and a half inches in length of wing, the greatest measurement of the bare part of the bill is 3·1 and the length of the middle toe without the claw is 3·4 inch.

The Grey-lag Goose is only a summer visitor to Germany, and forms a remarkable exception to the rule which applies to most migratory birds, that the earlier they arrive the later they depart. The Grey-lag appeared in Anhalt in Naumann's time late in February or early in March, often before the ice and snow had all gone; but in autumn many disappeared before the end of July, and by the end of August only those were left whose broods were exceptionally late.

The food of the Grey-lag Goose being almost entirely vegetable, it spends more of its time on land than on the water. Although it eats the tender shoots of various water-plants, it appears to prefer those which grow on the meadows. It eats grass, and is especially fond of grain of all kinds, of which barley is its favourite, hence it is fond of frequenting the stubbles. It is also fond of roots, and few vegetables grown in the kitchen-garden are not appreciated by it. It spends nearly the whole day eating, coming to its feeding-grounds before sunrise and remaining on them till evening. It chooses the wildest bit of land it can find on which to roost—if possible, where shrubs and reeds, long coarse grass, rushes, and other rank vegetation provide it with cover in which to hide itself. During the moulting-season, especially near its close, when the bird has dropped its quills and is unable to fly, it is still more careful to hide itself, remaining in cover all day. If possible, it chooses for this critical period of its existence a locality where it can take to the water if pursued, and those Geese which breed near the sea generally go out in a flock and remain on the ocean until their moult is over, only coming to shore in very stormy weather or in the dusk of the evening to feed. If pursued whilst in this comparatively helpless state, they seek protection in the water, diving with great ease. The Grey Goose is a very gregarious bird; it is seldom found singly or in isolated pairs, but it is at the same time very unsocial. It is very exclusive in its selection of society, rarely or ever being seen in the company of any other bird, not even mixing with other kinds of Geese; but it recognizes its specific identity with the Domestic Goose, and not unfrequently

feeds in its company on commons and other suitable places. The Grey gander has even been known to condescend to marry into the domesticated family, though he declines to be driven home with his mate to roost; but the tame gander does not appear ever to be successful in his attempts to woo the Wild Goose. On the wing the Grey Goose looks heavy and its flight laborious, but on migration it may often be seen at a great height in the air progressing with remarkable swiftness. It is capable of long-sustained, rapid, and steady flight: the birds appear to fly in families, which take the form of wedges, presumably with the old gander at the apex as leader; and when two or three families join together into a string they present the appearance of several **W**'s or **V**'s, of which first one **V** and then another is the leader. In the breeding-season, when a pair of geese fly together, the gander generally follows the goose.

The note of the Grey Goose closely resembles that of its congeners; it is not so musical as the trumpeting of the Swan, nor quite so harsh as the quack of the Duck. It is impossible exactly to represent it on paper: one of its notes, supposed to be associated with love and war, is a loud trumpet-like sound; but as one bird calls to another on migration, or on their feeding-grounds, it sounds something like *gag, gag*. When the goose and the gander are chattering together, it is lower and softer, and might be represented as *tat, tat, tat*; but when a flock of Geese are suddenly surprised it becomes an alarm-note—loud, shrill, harsh, long-drawn out at intervals, *kak, kak, kike*, sometimes even *ki-ike*.

The old Grey Geese arrive at their breeding-grounds in flocks; but as they pair for life, no time is lost before nest-building is commenced. The birds of the year remain in the vicinity of the breeding-grounds in small parties; but when they are old enough to breed (which is certainly not before they are almost two years old, and probably, in most instances, not until they are nearly three years old) they pair soon after their arrival in their breeding-grounds, a ceremony which is accompanied with many fights between the ganders for the possession of the geese. The Grey Goose is one of the earliest breeders; in Germany eggs may often be obtained before the end of March, and in Norway they are often laid in May, within the Arctic regions before the ice and snow are gone. The Grey Goose is a very shy bird, and chooses the most inaccessible swamps and the wildest moors and morasses for its breeding-grounds. Unfortunately localities lonely enough become rarer and rarer; in many places where it formerly bred in great numbers the Grey Goose is now entirely unknown. Naumann, who does not often give his readers a glimpse of the poetical side of his subject (except now and then in a footnote), apparently sharing the delusion of many modern writers that a true scientific history of a bird can be written without it, mentions very pathetically a now long-ago deserted breeding-place, where one glorious spring morning,

about the year 1825, he and one of his brothers breakfasted in the midst of six nests, all full of eggs, of Grey Geese in the company of their dear friend Nitzsch, the celebrated writer on pterylosis. Naumann describes the astonishment and delight of the great anatomist as they breakfasted together up to their knees in water in the great swamp; and it is easy to read between the lines how proud he and his brother, who knew every inch of the ground, felt as they introduced their learned friend to scene after scene of wonderful bird-life of which he had previously only dreamed.

The Grey Goose is by no means so arctic in its breeding-range as either the Bean-Goose or the White-fronted Goose, and it is only in Norway, under the influence of the Gulf-stream, that it is found nesting north of the Arctic circle. This sounds at first like a paradox; for the mists and rains brought up by the Gulf-stream cause the summer in Lapland to be much colder than that in Siberia; but the explanation is to be found in the fact that the summers in Lapland are much longer than they are in Siberia. The Siberian summer is not too cold to suit the Grey Goose; it is too short.

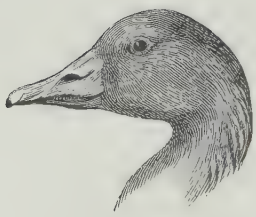
The Grey Goose builds a large slovenly nest of dead reeds, grass, and sedge, with sometimes a stick or two near the foundation. It is often a yard across and a foot high, and in cold climates is generally lined with moss, to which down is added as the eggs are laid. The number of eggs is usually six or eight, but nests have been found containing as many as fourteen. They are dull creamy white in colour, and vary in length from 3·7 inch to 3·2 inch, and in breadth from 2·5 to 2·2 inch. They cannot easily be confused with those of any other British Goose. They are larger than those of the White-fronted Goose, and heavier than those of any other species.

When the eggs are all hatched the goose takes her young down to the water to drink and swim, and to the green banks where the short tender grass furnishes them with delicate food. Every evening she leads them back to the old nest, where they roost under her wing. The gander, who all the time that his mate has been sitting has kept faithful watch and guard over her, takes his full share of the care and protection of the young family, until the time comes when he must retire to moult. The probable cause of the early breeding of the Grey Goose, and of other species of the genus, is to be found in the anxiety of these birds to fulfil their parental duties. By commencing as early as they do, the gander is generally able to devote his time to the young until they begin to have feathers, and the goose, who moults about a month later, is able to look after them until they can almost fly.

The Grey Goose is well known as one of the most familiar objects of the village green; but in a state of domestication it often becomes quite white. In a wild state it differs from the Bean-Goose in having the lower back

and rump a lavender-grey; the wing-coverts are more suffused with grey, and some of the feathers of the underparts are blackish brown, but never quite so many of them as in the White-fronted Goose. A narrow margin of white feathers surrounds the base of the bill. The bill is flesh-coloured, paler on the nail; legs and feet flesh-coloured; irides hazel.

Young in first plumage may be distinguished by the absence of the narrow white margin at the base of the bill, and by not having the underparts sprinkled with a few blackish-brown feathers. The nearest ally of the Grey Goose is the White-fronted Goose.



GREY-LAG GOOSE.

ANSER ALBIFRONS AND ANSER ALBIFRONS MINUTUS.

WHITE-FRONTED GOOSE and LESSER WHITE-FRONTED GOOSE.

The White-fronted Goose is one of those species of birds that is subject to great variation in size, especially in the dimensions of the bill, and has consequently been subdivided into two or three species. The bill, from the frontal feathers to the tip, varies in size from 1·15 to 2·35 inch. If we arbitrarily assume the mean of these measurements to be the dividing line between the large and the small races, we find that the smaller form appears to be confined to Arctic Russia and Siberia, whilst the larger form occurs throughout the range of the species. The peculiarity of a subspecifically distinct large and small race is one which is found in many species belonging to this genus. The synonymy of the two forms is as follows:—

ANSER ALBIFRONS.

White-fronted Goose.

(Plate 60.)

Anser septentrionalis sylvestris, *Briss. Orn.* vi. p. 269 (1760).
Branta albifrons, *Scop. Ann. I. Hist. Nat.* p. 69 (1769); **et auctorum plurimorum**
—(*Temminck*), (*Degland & Gerbe*), (*Naumann*), (*Dresser*), (*Saunders*), &c.
Anas albifrons (*Scop.*), *Lath. Gen. Syn. Suppl.* i. p. 297 (1787).
Anser albifrons (*Scop.*), *Bechst. Naturg. Deutschl.* iv. p. 898 (1809).
Anser medius, *Bruch, Isis*, 1828, p. 732.
Anser bruchii, *Brehm, Vög. Deutschl.* p. 841 (1831).
Anser intermedius, *Naum. Vög. Deutschl.* xi. p. 340 (1842).
Anser gambeli, *Hartlaub, Rev. Mag. Zool.* 1852, p. 7.
Anser albifrons roseipes, *Schleg. Naumannia*, 1855, p. 254.
Anser pallipes, *Selys-Longch. Naumannia*, 1855, p. 264.
Anser frontalis, *Baird, B. N. Amer.* p. 562 (1858).
Anser albifrons, *var.* gambeli, *Coues, Key N.-Amer. B.* p. 282 (1872).
Anser albifrons gambeli, *Ridgw. Proc. U. S. Nat. Mus.* 1880, p. 203.

ANSER ALBIFRONS MINUTUS.

Lesser White-fronted Goose.

(Plate 62.)

Anser erythropus, *Linn. Syst. Nat.* i. p. 197 (1766).
Anser finmarchicus, *Gunner, Leem. Beskr. Finm. Lapp.* p. 264 (1767).
Anser temminckii, *Boie, Isis*, 1822, p. 882.
Anser cineraceus, *Brehm, Lehrb. Naturg. Vög.* ii. p. 772 (1824).
Anser minutus, *Naum. Vög. Deutschl.* xi. p. 364 (1842); **et auctorum plurimorum**
—*Nilsson, Brehm, Schalow, Palmén, Cabanis, Malmgren, Collett, Homeyer, Taczanowski, Finsch, Blyth, Irby, Severtzow*, &c.

The White-fronted Goose is a winter visitor to the British Islands, but is somewhat local in its distribution and erratic in its appearance. It only occurs sparingly on the east coast of Scotland and visits the Shetlands at long intervals; whilst the same remarks apply to the west coast of Scotland, with the exception of Islay, where it is said to be very common. It is sparingly distributed on the Welsh and English coasts, but sometimes appears in large flocks. It is also a regular winter visitor to Ireland, where it appears to be commoner than in any other part of the United Kingdom.

The White-fronted Goose is a circumpolar bird, breeding in the Arctic Region of both hemispheres, and returning southwards to winter. It breeds in Greenland, Iceland, the northern portions of Scandinavia and Russia, and thence across Siberia to Behring Straits, and through Alaska across Arctic America. It passes along the coasts of Western Europe on migration, to winter on the coasts of the British Islands and France, occasionally straying as far south as Gibraltar, Italy, and Transylvania. It also migrates down the great river-valleys of Russia and Siberia to winter in Greece, South Russia, Asia Minor, North-east Africa, and the southern shores of the Caspian. It passes through Turkestan on migration and winters in North-west India. The East-Siberian birds winter in China and Japan. On the American continent it winters in the United States as far south as the Gulf of Mexico; but is most common in the central and western districts, being comparatively rare on the Atlantic coasts.

The notes of the White-fronted Goose are somewhat similar to those of the Grey Goose, but are more trumpet-like in tone and more rapidly repeated, so that it has sometimes been called the Laughing Goose. In other respects the habits of the White-fronted, Bean-, and Grey Geese are so similar that the description of one might almost pass for that of the others.

The White-fronted Goose breeds at a higher latitude than its congener the Bean-Goose, and still more so than its much closer ally the Grey Goose. At our winter-quarters on the Arctic circle, in the valley of the Yenesay, flocks of Bean-Geese had been seen almost constantly passing northwards for three weeks before the flocks of White-fronted Geese began to arrive; and Middendorff found it breeding in great abundance on the Taimur peninsula, between lat. 70° and 74°, where the Bean-Goose had become comparatively rare. He describes the nest as built on a grassy hillock, a mere hollow on the summit abundantly lined with down. Dall found it breeding in great numbers on the banks of the river Yukon in Alaska, and also describes the nests as mere depressions in the sand; but further east MacFarlane found that at the mouth of the Anderson River most of the nests were substantially lined with dry grass and feathers as well as with down. Five to seven appears to be the usual number of eggs,

but Dall once found ten eggs in one nest in Alaska. They are creamy white in colour, and vary in length from 3·1 to 2·8 inch, and in breadth from 2·1 to 1·9 inch.

The White-fronted Goose is about the size of the Bean-Goose, and is subject to the same variation. It resembles the Bean-Goose in the colour of its plumage; but the underparts are still more sprinkled over with nearly black feathers than is the case in the Grey Goose, and the white feathers at the base of the bill are much more developed, especially on the forehead, where they sometimes extend between the eyes, especially in the smaller examples. It further resembles the Grey Goose in having no black on the base or tip of the bill, which is yellow, paler on the nail; legs and feet yellow; irides hazel. The variation in length of wing is quite as great as in length of bill, the smallest examples measuring less than 12½ inches and the largest more than 17 inches.

Young in first plumage differ from adults in having no white feathers at the base of the bill and no dark brown feathers on the underparts. Birds of the year are intermediate between young in first plumage and adults in both these respects. The nearest ally of the White-fronted Goose is unquestionably the Grey Goose. Young in first plumage somewhat resemble Pink-footed or Bean-Geese, but may at once be distinguished by the absence of the black base of the bill.

WHITE-FRONTED GOOSE.

ANSER BRENTA AND ANSER BRENTA GLAUCOGASTER.

BRENT GOOSE and WHITE-BELLIED BRENT GOOSE.

(PLATE 60.)

The Brent Goose is a circumpolar bird, of which there are three races. The Pacific Brent Goose breeds from the valley of the Lena, eastwards across Behring Straits as far as the Rocky Mountains. It is probably specifically distinct, and may always be distinguished by the fact that the white marks on each side of the neck meet together in front. This species (*Anser nigricans*) has the belly almost as black as the breast. In the Taimur peninsula, in Nova Zembla, Franz-Josef Land, and Spitzbergen typical *Anser brenta* breeds, having the underparts generally as dark as those of the Pacific species, but with the white on the sides of the neck not meeting in front. In Arctic America, from the west coast of Greenland as far west as the Parry Islands, and north of lat. 73° as far as land is known to extend, the white-bellied form of the Brent Goose (*Anser brenta glaucogaster*) breeds; it has the underparts below the breast almost pure white and the white on the sides of the neck does not meet in front. Both the two latter races and intermediate forms between them occur on our coasts; but the white-bellied form is much the rarer of the two. The synonymy of the two forms is as follows :—

ANSER BRENTA.

BRENT GOOSE.

Anser brenta, *Briss. Orn.* vi. p. 304 (1760); *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 37 (1816); **et auctorum plurimorum**—(*Degland & Gerbe*), (*Bonaparte*), (*Salvadori*), (*Dresser*), (*Saunders*), &c.
Anas bernicla, *a*, *Linn. Syst. Nat.* i. p. 198 (1766).
Branta bernicla (*Linn.*), *Scop. Ann. I. Hist. Nat.* p. 67 (1769).
Anas brenta (*Briss.*), *Tunst. Orn. Brit.* p. 4 (1771).
Anser bernicla (*Linn.*), *Illiger, Prodr.* p. 277 (1811).
Bernicla brenta (*Briss.*), *Steph. Shaw's Gen. Zool.* xii. pt. 2, p. 46 (1824).
Bernicla melanopsis, *Macgill. Man. Brit. B.* ii. p. 151 (1842).
Anser torquatus (*Frisch, nec S. G. Gmelin*), *Bechstein, Naumann, Boie, Nilsson, Jenyns, Yarrell*, &c.

ANSER BRENTA GLAUCOGASTER.

WHITE-BELLIED BRENT GOOSE.

Bernicla glaucogaster, *Brehm, Vög. Deutschl.* p. 849 (1831).

The Brent Goose is a common winter visitor to the coasts of the British Islands, where it is almost universally distributed, but is said to be less abundant on the west coast of Scotland and the adjoining islands. It is

found at this season in the Orkneys and Shetlands, and is a regular winter visitor to the Channel Islands.

The breeding-range of the two forms of Brent Goose has been already given, so far as it is known. The bird is common on migration on the Faroe Islands, on the coasts of Scandinavia, and the shores of the Baltic, and has once been obtained at Archangel. It is found in winter on the coasts of Denmark, North Germany, Holland, Belgium, and North France, and occasionally visits the Mediterranean and Black Seas and the delta of the Nile. On the Atlantic coasts of America it is found in winter as far south as Texas, and has once been recorded from Lake Michigan.

Brent Geese are very common in winter on many parts of the east coast of England. By far the greater number are the dark-bellied variety, but a few examples of the pale-bellied form are obtained every year. The flocks of Brent Geese which visit our shores are generally composed of both young in first plumage and adult birds; unlike many species, these Geese appear to migrate in one flock, old and young together, but in some years no young appear at all. It is possible that some seasons are so cold in the high north where the Brent Goose breeds, that the eggs do not hatch. On our shores these birds are very wary; they lie out to sea during high tide, and when the falling waters have left the great mud-banks where the green grass-like herb *Zostera marina*, or grass-wrack, grows, they come up in enormous flocks to feed. They tear this plant up and eat the roots, as the Wigeon does. When a punt approaches, they rise in a mass long out of range, and fly about like a swarm of bees. A few of the oldest and most wary birds retire to the sea, but the majority settle down again to feed on the mud-banks. This may occur several times until the punt is within range, each time a further detachment of the old birds being separated from the flock, which often consists principally of young inexperienced birds when the fatal shot is fired.

In the extreme north of the Arctic regions the number of birds naturally diminishes. Capt. Feilden only saw about a score species north of lat. 81° in Grinnell Land, and four of these belonged to the Anatidæ, the Long-tailed Duck, the Common and King Eiders, and the Brent Goose. It is also the only Goose recorded from Franz-Josef Land in about the same latitude. Besides having a slightly more northern breeding-range than the Bernacle, it is decidedly more marine in its habits. When its favourite feeding-grounds on the mud-flats are under water during high tide, instead of retiring inland it goes out to sea. It is also said to be a less wary bird than its ally, and to allow of a much nearer approach without taking alarm. The cry of the Brent is a double note, which has been likened to the syllables *torock*, constantly repeated as the birds call to each other on the wing. In other respects the habits of the Brent Goose do not differ from those of the Bernacle Goose.

Thanks to the observations of Major Feilden, of the Nares Arctic Expedition, much more is known of the breeding-habits of the Brent than of the Bernacle. It arrived at its breeding-grounds in lat. 82½° on the 9th of June. Half a dozen pairs were breeding near Knot Harbour, and eggs were taken in the third week of June. The nests were made on the sloping hill-sides between the snow-line and the sea; they were placed in slight depressions on the ground with a good foundation of grass, moss, and the stems of saxifrages, and plentifully lined with down. Three nests were afterwards found on an island off the coast; the water was only knee-deep, the bottom being ice, as in the Siberian swamps, but the island was beyond the line of open water, which only extended a mile from the shore, and it was with the greatest difficulty that it was reached across the piles of ice-blocks and snow. The nests were exactly like those on the mainland. The gander was generally near the sitting goose, and attempted to defend her from intrusion. During the pairing-season the goose and gander were seen to rise in spiral flight to a great height, toying with each other. The stomachs of those which were shot were found to contain buds of *Saxifraga oppositifolia*. The number of eggs in each nest was four or five. They are creamy white in colour, finely granulated, and possess a slight gloss. They vary in length from 2·87 to 2·65 inch, and in breadth from 1·95 to 1·75 inch. They are indistinguishable from eggs of the Bernacle Goose, but when compared with eggs of the White-fronted Goose of the same dimensions may be distinguished by their lighter weight.

Feilden found that by the end of July most of the birds were moulting their quills and quite unable to fly; but they were able to run fast enough, and made for the nearest lake, where they attempted to find security by remaining in the middle out of gunshot.

The Brent Goose is intermediate in size between the Domestic Goose and the Domestic Duck. There is no difference in the colour of the sexes, and very little between that of summer and winter. In adult birds the entire head, neck, upper mantle, and upper breast are black, but on each side of the neck is a variegated black and white patch. The rest of the upper parts are slate-grey, except the quills, innermost secondaries, and tail-feathers, which are nearly black, and the sides of the rump and the upper tail-coverts, which are white. The underparts from the centre of the breast to the vent are quite different in the two forms: in the West-Atlantic form they are pure white, suffused with pale brown on the breast, and obscurely barred with brown on the flanks; in the East-Atlantic form they are a nearly uniform slaty brown, barred with white on the flanks. In both forms the underparts below the vent are white; bill, legs, feet, and claws black; irides hazel. In young in first plumage all the parts which are black in the adult are dark brown, the white patches on the neck are absent, the general colour of the back and wing-coverts

is browner, and each feather, including the innermost secondaries, has a greyish-white end; but the colour of the underparts below the centre of the breast is the same in both the eastern and western forms as in that of their respective adult plumages. The white feathers begin to appear during the first winter, but many of the feathers of the upper parts of birds of the year are more or less paler on their margins. Young in down (figured by Middendorff) are dark grey, shading into white on the centre of the belly and the sides of the head below the eye.

BRENT GOOSE.

BERNACLE GOOSE.

ANSER LEUCOPSIS.

BERNACLE GOOSE.

(Plate 60.)

Anser bernicla, } *Briss. Orn.* vi. pp. 300, 302 (1760).
Anser bernicla minor, }
Anas bernicla, *β*, *Linn. Syst. Nat.* i. p. 198 (1766).
Anas bernicla (*Briss.*), *Tunst. Orn. Brit.* p. 4 (1771).
Anas leucopsis, *Bechst. Orn. Taschenb.* ii. p. 424 (1803); **et auctorum plurimorum**—*Temminck*, (*Degland & Gerbe*), (*Naumann*), (*Bonaparte*), (*Dresser*), (*Saunders*), &c.
Anser leucopsis (*Bechst.*), *Bechst. Naturg. Deutschl.* iii. p. 921 (1809).
Bernicla leucopsis (*Bechst.*), *Boie, Isis*, 1822, p. 563.
Branta leucopsis (*Bechst.*), *Bannist. Proc. Acad. Nat. Sci. Philad.* 1870, p. 131.

The Bernacle Goose, possibly so-called from the name of the shellfish which was popularly supposed to develop into it, most probably gave its name to the mollusk. The word is spelt "Bernacle" by the majority of ornithologists, including Pennant, Bewick, Newton, and Saunders; but others, amongst whom may be enumerated Selby, Macgillivray, Yarrell, and Gould, spelt it "Bernicle"; whilst the dictionaries almost unanimously regard "Barnacle" as the legitimate word. Unfortunately its derivation is absolutely unknown; but in 1555 Gesner spelt it "Bernicla," and a hundred years later Willughby and Ray quote both words, "Bernicla seu Bernacla."

The Bernacle Goose is a fairly common winter visitor to the coasts of the British Islands, but is most abundant on the west coasts of Scotland. Saxby only observed it once in Shetland. In Ireland it is locally distributed, being most common in the north and north-west. It sometimes visits inland districts.

Although the Bernacle Goose has never been found breeding in a wild state, it has been recorded during the breeding-season from Greenland, Iceland, Spitzbergen, and Nova Zembla*. It is an accidental visitor to the

* The Bernacle Goose was first recorded from Spitzbergen by Nordenskiöld; but the correctness of his identification of the species was doubted by some ornithologists (Newton, Ibis, 1865, p. 513) until it was confirmed by Malmgren (Ibis, 1869, p. 230) and by the fact that seven examples of the Bernacle Goose were actually shot on the island (Eaton, 'Zoologist,' 1874, p. 3815). Its occurrence on Nova Zembla also rests upon the authority of Nordenskiöld, who remarks ('Voyage of the Vega,' i. p. 126), "On Spitzbergen, besides the Bernacle Goose" (the name applied by Nordenskiöld to the Brent Goose, as proved by the woodcut on the previous page) "we meet with the closely allied species, *Anser leucopsis*, Bechst. It is rather rare, but more common in Novaya Zemlya." Under these circumstances I cannot agree with Saunders that "there does not appear any evidence that this species has been found in Novaya Zemlya" (Yarr. Hist. Brit. Birds, 4th edit. iv. p. 288).

Faroes and the Atlantic coasts of the United States. It is said to be rare on the autumn passage at Archangel, and passes regularly on migration along the shores of Scandinavia to winter in the Baltic and on the coasts of Denmark, Holland, Belgium, and Northern France. It occasionally wanders to Central Europe, and has occurred as far south as the Spanish peninsula. On the American continent it is represented by various races of Canada Goose (*Anser canadensis*), from all of which it may be distinguished by its white instead of black forehead, and black instead of white upper breast.

The Brent and Bernacle Geese are constantly confused together by careless observers; even Linnæus regarded the Bernacle as only a variety of the Brent; and consequently the name of Bernacle Goose has constantly been applied to the allied species. The two birds, however, are very distinct—so much so indeed, that the American ornithologists have actually placed them in different genera! To avoid further confusion, it might be wise partially to adopt the suggestion of Macgillivray, and call the two birds the Black-faced Brent and the White-faced Bernacle. There are several minor points in which they differ in their habits. The Bernacle is much the shyer bird of the two, and though it goes down to the mud-flats to feed at low water, it leaves them as soon as the tide has risen, and seeks some grassy bank of a river or lake, where it finds not only seclusion from observation, but also a kind of food which it appears to prefer to the marine vegetation on the mud-flats. It is quite as gregarious as its allies, can fly with great rapidity, and run, if from any cause unable to fly, with a speed that makes pursuit difficult. The note of the Bernacle is a short trumpet-like nasal *hân hân*.

There can be scarcely any doubt that the Bernacle Goose breeds in Spitzbergen. The Rev. A. E. Eaton, who accompanied Leigh Smith in his visit to that island in 1873, states ('Zoologist,' 1874, p. 3815) that he found a flock of about a dozen on a small lake on a hill in the north of Spitzbergen, opposite Diana Island. The birds were in full moult and quite unable to fly on the 22nd of July, a date only five days earlier than that on which I witnessed the extraordinary migration of Bean-Geese in exactly the same condition on the lagoon of the Petchora. Mr. Eaton and his companion shot seven of the flock of Bernacle Geese, and the rest ran off as fast as their legs could carry them until they reached the sea, where they were seen two days afterwards.

Collett is of opinion that the Bernacle Goose breeds on one of the Loffoden Islands in lat. 68° 15′. The proprietor of this island sent him two eggs of a Goose "with white cheeks, but having the rest of the plumage and the feet dark," and "having a slight resemblance to a Cormorant." He further stated that a solitary pair had bred on the island for some years past, and built a nest composed of moss and straw, sometimes on the

narrow ledges of the rocks, and sometimes in a sheltered locality under stones or isolated rocky masses, laying five eggs.

These meagre and doubtful details are all that is known of the breeding of the Bernacle Goose except in a state of domestication. Eggs laid in confinement are creamy white, granulated in texture, and without gloss. They vary in length from 2·9 to 2·75 inch, and in breadth from 2·0 to 1·85 inch. The Loffoden-Island eggs received by Collett are slightly smaller, measuring 2·6 by 1·8 inch. They are indistinguishable from eggs of the Brent Goose, but may possibly be distinguished from eggs of the White-fronted Goose by their relatively lighter weight.

The Bernacle Goose is slightly larger than the Brent Goose, and the male is slightly larger than the female, but there is no difference in colour between the two sexes. In the adult the fore half of the head is entirely white except a black band passing through the eye and round the base of the upper mandible; the hind head and the neck, extending to the upper back and the upper breast, are glossy black; the feathers of the mantle, the scapulars, wing-coverts, and innermost secondaries are pale slate-grey tipped with white, and subterminally barred with black; the lower back and centre of the rump are brownish black; the sides of the rump and the upper tail-coverts are white; the quills and tail-feathers are nearly black. The underparts below the centre of the breast are white, obscurely barred with grey and brown on the sides of the breast, the flanks, axillaries, and under wing-coverts. Bill, legs, feet, and claws black; irides hazel. In young in first plumage the white on the head is suffused with buff, the black on the hind head, neck, and breast is suffused with brown, which is still more marked on the upper back, all the white tips to the feathers of the upper parts are suffused with brown, and the tail-feathers are tipped with greyish white. After the first autumn moult a plumage is assumed intermediate between that of the young in first plumage and the adult. Young in down (bred in confinement near Newcastle by Captain Noble) have the upper parts pale slate-grey, and the underparts greyish white.

ANSER RUFICOLLIS.

RED-BREASTED GOOSE.

(Plate 61.)

Anser ruficollis, *Pall. Spicil. Zool.* vi. p. 21, pl. v. (1769); **et auctorum plurimorum**—(*Temminck*), (*Degland & Gerbe*) *Naumann*, (*Dresser*), (*Saunders*), &c.

Anas torquata, *S. G. Gmel. Reise Russl.* ii. p. 179, pl. 14 (1774).

Anas ruficollis (*Pall.*), *Lath. Gen. Syn. Suppl.* i. p. 297 (1787).

Bernicla ruficollis (*Pall.*), *Boie, Isis*, 1822, p. 563.

Rufibrenta ruficollis (*Pall.*), *Bonap. Compt. Rend.* xliii. p. 648 (1856).

The occurrence of the Red-breasted Goose in our islands is purely accidental, but its breeding-range is situated far enough north for occasional stragglers from the eastern shores of the Kara Sea to mingle with the flocks of Brent and Bernacle Geese which migrate to our shores in autumn from Franz-Josef Land, Nova Zembla, and Spitzbergen. Of the half-dozen authentic specimens obtained in this country, one example was brought down with the same shot that killed twenty-three Bernacle Geese, and a second was shot out of a flock of Brent Geese. The first recorded British example was said by Tunstall to have been shot in the severe frost early in the year 1776, in the neighbourhood of London; it was figured by Bewick, and is still preserved in the Newcastle Museum. The last example was obtained on the 6th of January 1871, at Maldon, in Essex (Harting, 'Zoologist,' 1871, p. 2514). Between these two dates eleven other examples are recorded: three of these having only been seen, may be at once dismissed as doubtful. An example was caught alive in Yorkshire, which Latham stated to have died in 1785, after having been kept nearly ten years in confinement (Lath. Gen. Syn. iii. p. 455). The example said to have been shot in Norfolk in 1805 does not appear to have been satisfactorily determined, nor is there any proof of the correct identification of the examples said to have been obtained in Cambridgeshire during the severe winter of 1813. An example shot at Berwick-on-Tweed in 1818 is still preserved in the British Museum (Fleming, Brit. Animals, p. 128). Two examples have been obtained in Devonshire, one in 1828, and one in 1837 (Moore, Loudon's Mag. Nat. Hist. 1837, p. 366). Two Irish records are more than doubtful, as is also the example said to have been shot about 1845 in Durham.

So far as is known, the Red-breasted Goose is confined during the breeding-season to the lower valleys of the Obb and the Yenesay above the limit of forest-growth. It passes through South-western Siberia and

Northern Turkestan on migration to winter in the Caspian Sea. Elsewhere its occurrence is only accidental. A stray example has been obtained as far east as Irkutsk. There is no authentic instance of its having occurred in Egypt beyond the fact that unmistakable figures of this species have been found on some of the ancient Egyptian papyri. It has occurred accidentally in every country in Europe except the Spanish peninsula.

The Red-breasted Goose is one of the rarest birds in collections, and until recently examples in adult plumage were sold for as much as five pounds each. It is, nevertheless, a very abundant species, and occurs in such enormous numbers in its winter-quarters that thousands are sold every year at prices varying from three halfpence to twopence halfpenny each. The explanation of these extraordinary facts is to be found in its extremely restricted range, which is more limited than that of almost any other Palæarctic bird. There is no evidence that it has ever bred west of the Ural Mountains, or as far east as the North-east Cape on the Taimur peninsula. Middendorff found it breeding in some numbers on the Boganida river, in long. 115°, and heard of it as still more numerous at the mouth of the Piasina river, ten degrees further west. I obtained its eggs and saw broods of young with their parents about long. 105°, and Finsch saw flocks in autumn in long. 85°. It is probable that it never breeds more than three hundred miles from the coast. Small as this range appears to be, it includes an area of a hundred and fifty thousand square miles. The line of migration in autumn appears to be across the plains of the Taz, which scarcely rise above the level of the sea, to the valley of the Lower Obb, and thence up the valley of the Lower Irtish into that of the Tobol. The sources of this river almost join those of the Ural, which leads direct into the Caspian. Radde describes its great abundance in winter on the islands near the south-west shores of the Caspian. After a heavy fall of snow, the fishermen clear a space on the grassy islands and often catch them in such numbers in nets, that they are sold at from five to ten kopeks each. When they begin to collect before migration, thousands of flocks are reported to be seen, and it is stated that the worst shots obtain as many as two hundred birds during the season. When feeding together they utter a short trumpet-like note; but their cry as they call to each other on migration is a double note, which Finsch says is easily imitated by the aid of a bit of birch-bark, and which Pallas represents as resembling the sound of the syllables *shak-voy*, whence its local name amongst the Russian sportsmen of Obdorsk. It is an extremely shy bird and very difficult to shoot, but, curiously enough, reconciles itself at once to confinement, and soon becomes very tame.

Very little is known of the nesting-habits of the Red-breasted Goose, which appears to be a late breeder. Middendorff obtained slightly incubated

eggs on the Boganida river on the 6th of July, and the egg which is figured in the present work was obtained on the 1st of July, about two hundred miles due east of that locality. When I was in the valley of the Yenesay I gave the two mates belonging to Schwanenberg's schooner a commission to collect eggs for me in the delta where they were stationed in lat. 70½°. They were fortunate enough to come suddenly upon a Red-breasted Goose sitting on her nest on one of the islands in the delta. They shot her before she flew off, unfortunately breaking one of the two eggs on which she was sitting. I neither saw nor heard anything more of this species until the return journey on the 28th of July. A few miles south of the island where the nest was taken, as we were slowly steaming up the river against stream and close in shore, I saw several of these handsome birds with their young broods on the banks. Unfortunately the captain was racing to Doodinka, anxious to arrive there before one of his rivals, so that I was unable to persuade him to stop. The mates told me that the nest was indistinguishable from that of the Bean-Goose, except that it was somewhat smaller. My egg measures 2·7 inch in length and 1·8 inch in breadth. The colour is creamy white, with obscure traces of an underlying green shell; the surface is rather smooth but not glossy, and the shell is very fragile. Middendorff's eggs varied in length from 2·8 to 2·7 inch, and in breadth from 1·76 to 1·73 inch. No others are known.

The only information which we possess respecting its winter habits is that furnished us by Radde, who states that it is a very gregarious bird, always seen in flocks, which frequent the pastures on the southern shores of the Caspian during the day, and retire far out to sea for the night.

Dresser's statement that the Red-breasted Goose has been met with breeding on the Caspian is a myth, which probably derives its origin from a paragraph in Blanford's 'Eastern Persia,' where it is stated, on the authority of Col. St. John, that a species of Goose breeds in the marshes near Shiraz. There can be no doubt whatever that the species breeding in Persia is the Grey-lag Goose.

The Red-breasted Goose is intermediate in size between the Bernacle Goose and the Brent Goose; the female is slightly smaller than the male, but the two sexes do not differ in the colour of their plumage. The adult Red-breasted Goose is one of the handsomest birds that visits the British Islands, though, like the Harlequin Duck, the pattern of its coloration is somewhat loud, but is composed of only three colours, glossy black, snowy white, and rich chestnut. The general colour of the upper parts is black, interrupted by a narrow white ring across the upper back, the median and greater wing-coverts are tipped with white, and the sides of the rump and the upper tail-coverts are white; the black on the crown extends through the eye to the chin and upper throat, leaving a large white patch between the eye and the bill, and a still larger chestnut patch on the sides of the

head and upper neck, surrounded by a narrow white margin, which is extended down the sides of the neck between the black hind neck and the chestnut fore neck and upper breast; the white ring from the upper back extends round the breast, and is separated from the chestnut upper breast by a narrow black margin. The breast below the white ring, the axillaries, under wing-coverts, and flanks are glossy black, the latter broadly barred with white; the belly, vent, and under tail-coverts are pure white. Bill, legs, feet, and claws black; irides hazel. Young in first plumage are unknown, but birds of the year, after the first autumn moult, differ from adults in having the black replaced by dark brown, and the rich chestnut by chestnut-buff; the chestnut patch on the sides of the neck is mottled with black and white, the black margin above the white ring is absent, and all the wing-coverts have paler margins. Radde states that the adult plumage does not arrive at perfection until the third year. Young in down are unknown.

Great numbers of Geese of various species have been introduced into this country and live and breed in a semidomesticated state in zoological gardens, parks, and on ornamental waters in pleasure-grounds. These often escape, and their capture has given rise to numerous claimants for admission into the British list; but none of them can be regarded even as accidental visitors to our shores. Amongst these may be enumerated:—the Spur-winged Goose (*Plectropterus gambensis*), a resident in West and South Africa; the Egyptian Goose (*P. ægyptiacus*), a resident in East and South Africa; the Bar-headed Goose (*Anser indicus*), a winter visitor to India, breeding in Mongolia; the Chinese Goose (*A. cygnoides*), a winter visitor to China, breeding in East Siberia; and the Canada Goose (*A. canadensis*), a winter visitor to Mexico, breeding in the arctic regions of America as far south as lat. 42°. The eggs of the Canada and Egyptian Geese are figured on Plate 62.

RED-BREASTED GOOSE.

Genus TADORNA.

The Sheldrakes were included in the genus *Anas* by both Linnæus and Brisson; but in 1822 Fleming, in his 'Philosophy of Zoology' (ii. p. 260), and Boie, in the 'Isis' (1822, p. 56), made a new genus for the reception of the Common Sheldrake, each of them adopting the specific name which Linnæus bestowed upon this bird (which consequently becomes the type) as the title of the new genus.

The Sheldrakes, being also non-diving Ducks, resemble the species of the genus *Anas* in having the hind toe furnished with a very small membrane. They are large birds, with the tarsus nearly as long as the middle toe and claw, and the colours of their plumage are generally black, white, and chestnut. The shoulder of the wing is white and armed with a projecting knob, like an incipient spur, but covered with feathers.

The Sheldrakes resemble the Geese, not only in having longer legs than the other Ducks and the Swans, but also in the important facts that the difference between the sexes is generally very slight, and that the drake has no summer dress. Both sexes moult once in the year, in autumn, the drake a month earlier than the duck.

Only six species of Sheldrakes are known: two breed in the temperate portion of the Palæarctic Region, one in South Africa, two in Australia, and one in New Zealand.

The flight of the Sheldrakes is very different from that of the Ducks and Geese, but closely resembles that of the Swans, being performed, like that of most large birds, by slow and regular beats of the wings. They swim with ease, but rarely dive. On the land they walk almost as well as the Geese. They are almost exclusively coast-birds, being rarely found inland except on salt lakes or saline marshes. It is difficult to say whether they are fonder of animal or of vegetable food. Their notes are harsh. They select holes under ground, the ledges of cliffs, or hollow trees in which to lay their eggs. The Sheldrakes further resemble the Geese, and differ from the Ducks, in the circumstance that the drake takes his share in the education and protection of the young.

TADORNA CORNUTA.

COMMON SHELDRAKE.

(Plate 66.)

Anas tadorna, *Briss. Orn.* vi. p. 344 (1760); *Linn. Syst. Nat.* i. p. 195 (1766).
Anas cornuta, *S. G. Gmel. Reise Russl.* ii. p. 185, pl. 18 (1774); **et auctorum plurimorum**—(*Gray*), (*Blasius*), (*Heuglin*), (*Salvadori*), (*Dresser*), (*Saunders*), &c.
Tadorna tadorna (*Linn.*), *Fleming, Phil. Zool.* ii. p. 260 (1822).
Tadorna familiaris, *Boie, Isis*, 1822, p. 564.
Tadorna bellonii, *Steph. Shaw's Gen. Zool.* xii. pt. 2, p. 72, pl. 45 (1824).
Tadorna vulpanser, *Flem. Brit. An.* p. 122 (1828).
Vulpanser tadorna (*Briss.*), *Keys. & Blas. Wirb. Eur.* p. lxxxiv (1840).
Tadorna gibbera, *Brehm, Vög. Deutschl.* p. 856 (1831).
Tadorna cornuta (*S. G. Gmel.*), *Gray, Hand-l. B.* iii. p. 80 (1871).

The Sheldrake, sometimes called the Burrow-Duck, because it breeds in a hole like a rabbit-burrow, has had its name variously corrupted into Shield-drake, Shield-duck, Shell-duck, and Sheld-duck. The name is derived from the low German *Scheldrak*, which may possibly refer to the shield-like protuberance at the base of the upper mandible of the bill; but Willughby and Ray stated, more than two hundred years ago, that they were called "*Sheldrakes* because they are particoloured." In Norfolk it is provincially known as the Bargander, a corruption of Willughby and Ray's Bergander, a name borrowed by them from Aldrovandus, and obviously derived from the high German *Bergente*, though some writers interpret it as Burgander, "bur" being a common north-country term for a burrow.

The Common Sheldrake is a resident in the British Islands, and is found more or less numerously on all suitable parts of the coast, but is much scarcer in the south of England during the summer than elsewhere. Owing to the persecution which it has suffered it has become much rarer in many districts than was formerly the case, and it is now most abundant in little-frequented districts or in places where it is protected. In winter it often wanders from its usual summer haunts, and at that season is more universally dispersed.

The Common Sheldrake is an Old-World species of Duck, but it breeds from the Atlantic to the Pacific. A single example has been obtained on the Faroe Islands. On the Norwegian coasts it breeds up to about lat. 69°, but in the Baltic it is not known to breed north of lat. 60°. It occurs in the Ural Mountains about as far north as lat. 56°, but in Siberia it does not breed north of the valley of the Amoor. South of these

limits it breeds throughout Europe in suitable localities. In the basin of the Mediterranean it is principally known as a winter visitor, though a few remain to breed on both shores. It is a resident in the basins of the Black and Caspian Seas, but to Turkestan and Mongolia it is only known as a summer visitor. It is probably a resident in Japan, and is a winter visitor to the coasts of China and India as far south as lat. 22°. The Common Sheldrake has no ally with which it is likely to be confused.

The breeding-grounds of the Sheldrake are for the most part mild enough for it to be a resident, but in the northern portion of its range it is a migratory bird, arriving in March and leaving in October. It is almost exclusively a marine species, breeding in Europe on sandy coasts; but in Asia east of the Caspian, in Turkestan and Mongolia, it frequents inland salt lakes, and in Southern Siberia it is confined to the salt steppes. In its winter-quarters in India, though it sometimes visits the broads and large sheets of fresh water, it always seems to prefer the coast. In England it is rarely if ever seen inland, always preferring the sandy coasts, especially where the sand is blown into hills, locally called "links" or "dunes." Nowhere is the Sheldrake more abundant than on the west coast of Denmark, where it may almost be said to live in a state of semi-domestication, the peasants making artificial burrows in the sand-hills and robbing the nests systematically until the middle of June, when they allow the birds to begin to sit. Under these circumstances it may almost be said to breed in colonies, but in a truly wild state it is never known to do so.

The Sheldrake is a somewhat shy bird, and is more or less gregarious even in the midst of the breeding-season. I found it extremely abundant on the shores of the Black Sea, and small parties of them, mostly consisting of last year's birds which were probably not breeding, were the most conspicuous objects on the lagoons which are so numerous between the Danube and the coast. The call-note of the Sheldrake, which is common to both sexes, is a harsh quack. During the pairing-season the male utters a clear rapidly repeated whistle or trill; and when the young are hatched his anxious alarm-note to his mate on the approach of danger may constantly be heard, and resembles the syllables *kor kor*, uttered in a deep tone. The flight of the Sheldrake is performed by slow and laboured beats of the wings, very unlike the rapid motion of smaller Ducks, and much more resembling that of the Swan. Although the Sheldrake seldom or never dives, it obtains most of its food in shallow water, aquatic plants, mollusks, and various water-insects being obtained in the freshwater lagoons, whilst seaweeds and marine animals of various kinds are sought for on the shore. In searching for food they continually immerse the head and upper half of the body, only the tail and rump being visible. On the land they walk with ease, like a Goose. The Sheldrake resembles the Geese in some of its habits, and frequents the pastures, especially in early

morning, but not so much to feed upon grass as to search for worms and slugs.

So far as is known the Sheldrake never breeds in the open, but always in a burrow, generally in that of a rabbit, but less frequently in that of a fox or a badger, and there are reliable instances on record of their having hatched out their young whilst the original owner of the burrow was still in occupation. Sometimes the birds excavate a burrow for themselves, which is generally more or less winding, and extends from six to twelve feet, ending in a chamber, in which the eggs are laid upon a handful of dead grass and scraps of moss. Where it is protected, the Sheldrake is an early breeder, eggs being frequently laid before the end of April; but in localities where it is disturbed, fresh ones may be found as late as the end of May and the beginning of June. Seven to twelve is the ordinary number, but occasionally as many as sixteen are laid; and where the nests are regularly robbed, as many as thirty have been obtained from a single burrow in one season. They are creamy white in colour, somewhat smooth in texture, and have very little gloss. They vary in length from 2·75 to 2·5 inch, and in breadth from 2·0 to 1·9 inch. Like that of most Ducks which breed in holes, the down is very pale in colour, a beautiful lavender-grey, mixed with a few nearly white tufts and a few feathers. The eggs of the Common Sheldrake are absolutely indistinguishable from those of the Ruddy Sheldrake. I have not seen the down of the latter species, and am consequently unable to say if it presents any points of distinction; but the much smaller and much darker down in the nest of the Black Scoter prevents any confusion with the eggs of that bird, which are otherwise scarcely distinguishable, though when carefully compared they will be found to be buffer in colour, smoother in texture, and lighter in weight.

Incubation lasts from three to four weeks. It is said that the male does not assist the female either in the construction of the nest or in the incubation of the eggs; but he remains in the neighbourhood to warn his mate of the approach of danger, and when the young are hatched he assists her in bringing up the brood, tending them almost as assiduously as she does. Naumann says that the duck carries her young ones in her beak one by one to the water, where they remain until able to fly. He also states that on the island of Sylt, where artificial burrows are made for the reception of the nest, with loose sods over the nest-cavity, which can be removed for the abstraction of the eggs, the female always carefully covers her eggs before leaving them, proving that, in this case at least, the eggs are covered for the sake of warmth, and not for concealment.

The Sheldrake is decidedly larger than the Mallard and is one of the handsomest of the British Ducks. The adult male has the entire head and upper neck rich black, glossed with green, the feathers on the nape and upper neck somewhat elongated; a broad ring round the lower neck,

spreading out on the upper breast, the lower back, rump, upper tail-coverts, innermost scapulars, innermost secondaries, upper and under wing-coverts, axillaries, and the sides of the belly and flanks are white; the under tail-coverts, upper back, and sides of the breast are chestnut, leaving a broad black line down the centre of the breast which broadens out on the belly and vent; the primaries and outermost scapulars are black, the latter glossed with green; the tail is white, broadly tipped with black; the secondaries have the basal half white, the terminal portion black, the outermost ones having the outer web glossed with bronzy green, forming a metallic alar speculum; the three longest are chestnut, emphasized by a black base near the shaft on the outer, and by white on the inner webs. Bill and frontal shield crimson; legs and feet pink; irides hazel. After the autumn moult the shield at the base of the bill almost disappears. The female resembles the male in colour, but has the plumage a trifle duller, and she is also smaller in size, and is without the conspicuous shield at the base of the upper mandible. Young in first plumage have the forehead, chin, sides of the face, and a narrow streak down the throat dull white; the rest of the head and neck is blackish brown; the white ring round the lower neck is narrow; the upper back and scapulars are dark brown, each feather with a greyish-white margin; the tail is tipped with brown instead of black; the sides of the breast are brown, with pale margins to the feathers, and the rest of the underparts are pure white; the remainder of the plumage resembles that of the adult, but the colours are not so pure; the four innermost primaries and most of the secondaries are broadly tipped with white, the basal two thirds of the inner web of the first primary is nearly white, and the chestnut on the innermost secondaries is not so developed and is much duller. Bill, legs, and feet flesh-colour; frontal shield absent. After the first autumn moult a nearly adult plumage is assumed, but the green parts are browner, the chestnut is paler and less in extent, the wing-coverts are mottled with grey, the wings, not being moulted in the first autumn, remain as in the young in first plumage, and the frontal shield is not assumed until after the second autumn moult. Young in down are dark brown above and white below, the white on the underparts extending to the forehead, sides of the head and neck, wings, scapulary region, and sides of the rump.

TADORNA RUTILA.

RUDDY SHELDRAKE.

(Plate 66.)

Anas casarca, *Linn. Syst. Nat.* iii. p. 224 (1768).
Anas rutila, *Pall. Nov. Com. Petrop.* xiv. p. 579 (1770); **et auctorum plurimorum** — *Temminck, Bewick, (Jenyns), (Selby), (Gould), (Jerdon), (Hume), (Blyth), (Scully), (David & Oustalet), (Oates), (Yarrell), (Salvadori)*, &c.
Anser casarca (*Linn.*), *Vieill. N. Dict. d'Hist. Nat.* xxiii. p. 341 (1818).
Tadorna rutila (*Pall.*), *Boie, Isis*, 1822, p. 564.
Casarca rutila (*Pall.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 56 (1838).
Vulpanser rutila (*Pall.*), *Keys. & Blas. Wirb. Eur.* p. lxxxiv (1840).
Tadorna casarca (*Linn.*), *Macgill. Man. Brit. B.* ii. p. 163 (1842).

The Ruddy Sheldrake is a very rare straggler to the British Islands, and it is not improbable that of the few recorded instances of its occurrence, several if not all were those of escaped birds, as it is one that is kept very commonly on ornamental waters. The first recorded British example was shot at Bryanstone, near Blandford in Dorsetshire, in the severe winter of 1776, and is now preserved in the Newcastle Museum (Fox, Synops. Newcastle Mus. p. 142). A second is said to have been killed previous to 1833 in the south of England, but no date or exact locality is given (Selby, Brit. Orn. ii. p. 294). Another is recorded as having occurred at Sanday in the Orkneys, in October 1831 (Baikie and Heddle, Hist. Nat. Orcadensis, p. 74). A fourth was shot at Iken, near Orford in Suffolk, in January 1834 (Clarke, Loudon's Mag. Nat. Hist. vii. p. 151), and a fifth on the Murrough of Wicklow on the 7th July, 1847 (Thompson, Ann. Nat. Hist. xx. p. 171). In 1864 one was seen near Blackstakes in Suffolk, in company with some Common Sheldrakes (Hele, 'Notes about Aldeburgh,' p. 150); and on the 17th of August, 1869, another was shot near Tralee, co. Kerry (Blake Knox, 'Zoologist,' 1870, p. 2105). Several other examples of the Ruddy Sheldrake have been recorded, but no dates are given: one is said to have been shot at Collingham in Yorkshire, "some years ago" (Clarke and Roebuck, 'Handbook Vert. Fauna Yorks.' p. 55); and another at Caithness (Wilson, 'Voyage round Scotland,' ii. p. 180). Sir Ralph Payne-Gallwey mentions one shot in the county of Waterford, and another "Irish specimen," of which no locality is given, is preserved in the museum of Trinity College ('Fowler in Ireland,' p. 66).

The European range of the Ruddy Sheldrake does not extend nearly so far north as that of the Common Sheldrake; but in Asia, though its winter-range extends further to the south, it is said to breed as far north as its

congener. North of the Spanish peninsula, the valley of the Danube, and South Russia it is only known as an accidental visitor to Germany, Denmark, and Sweden. It is a resident in the basins of the Mediterranean and Black Seas, and frequents the lakes and rivers of Northern Africa, but principally as a winter visitor. East of the Ural Mountains it breeds throughout Persia, Turkestan, and Southern Siberia, but not further north than Lake Baikal and the valley of the Amoor. It may possibly breed in Japan, and is a regular summer visitor to Mongolia, but is only known to winter in China, Burma, and India, in all which countries it is said to be very common. It has no ally with which it is likely to be confused.

Although the Ruddy Sheldrake is a resident in Europe, in Asia it is a migratory bird. It arrives at its breeding-grounds in South Siberia during the last three weeks of April, and migrates southwards again from the middle of August to the middle of September. Unlike the Common Sheldrake, this species prefers fresh to salt water, and is rarely seen upon the coast; it is also more of a land-bird than its congener, frequently grazing on young grass and corn near the water's edge, and sometimes visiting the inland pastures in the company of Geese. It is especially fond of rivers where there are broad reed-beds and numerous sand-banks. On the Danube it not only frequents the lagoons on the shores of the Black Sea, but is often seen far inland on the tributaries of the great river. It is a very gregarious bird during migration, but both in its breeding- and winter-quarters it lives for the most part in somewhat isolated pairs, especially on the rivers, where every half-mile or so a fresh pair of birds may be observed.

The food of the Ruddy Sheldrake consists of water-insects of various kinds, both land and freshwater mollusks, grass, and aquatic plants, with occasionally a small fish or a young frog. It does not dive to procure its food, but will do so in its efforts to escape if wounded. It is quite as wary a bird as its congener, and its flight is very similar, reminding one more of a Heron than of a Duck.

The Ruddy Sheldrake sometimes breeds in a burrow, frequently in a hollow tree or in a hole in a fallen log. Salvin found it breeding in Algeria in the crevices of the cliffs. Canon Tristram obtained its nest in a similar situation in Palestine; and Dybowsky took the eggs out of the deserted nests of birds of prey. It is a somewhat early breeder. Dybowsky found eggs in Dauria in the middle of May; and on the Danube I have seen the old birds swimming about with their young on the 30th of May. The eggs, eight to sixteen in number, are creamy white in colour, and are absolutely indistinguishable from those of the Common Sheldrake; possibly there may be a slight difference in the colour of the down. They vary in length from 2·78 to 2·6 inch, and in breadth from 2·0 to 1·7 inch. The nests are frequently placed at a considerable distance from water, and it is

said that the parents carry the young birds to it in their beaks one by one, sometimes for great distances.

It is difficult to imagine a more beautiful sight than a pair of Ruddy Sheldrakes with their young, the duck enticing them to follow her in order to hide amongst the reeds, whilst the drake swims about backwards and forwards in an agitated manner, uttering a rather loud and monotonous cry, intermediate in sound between that of the syllables *kark* and *kerk*. I once surprised a brood of half-grown Ruddy Sheldrakes, at some little distance from the water's edge, on the banks of Lake Tuzla, a salt lagoon connected with the Black Sea. I tried to catch them before they reached the water, but they were too quick for me; meanwhile the old birds flew round and round within easy shot, uttering their peculiar cry, and trying to draw off our attention from their brood. Like the Common Sheldrake, the Ruddy Sheldrake differs in its habits from the more typical Ducks, one of its peculiarities being, that when the young are hatched the drake takes his share in looking after them. He does not moult into summer dress, and consequently is not obliged to desert his mate at the most critical period of her annual duties, to hide himself in the thick morasses.

The adult male Ruddy Sheldrake has the head and upper neck chestnut-buff, palest on the forehead, cheeks, and throat; a narrow black band encircles the lower neck; below this the upper back, mantle, scapulars, and the whole of the underparts are rich chestnut; the lower back is buff, vermiculated with black; the upper tail-coverts and tail are rich deep black glossed with green; the wings are very similar to those of the Common Sheldrake, but the innermost secondaries have the entire outer web chestnut, and the inner web dark slate-grey. Bill, legs, and feet nearly black; irides dark hazel. The female closely resembles the male in colour, but the black ring round the neck is absent, and the fore part of the head is paler. Young in first plumage somewhat resemble females, but the wing-coverts, the scapulars, and the innermost secondaries are suffused with brown. Males of the year are without the black collar; and it is said by Hume that adult males are without it during the months of December, January, and February; but the subject requires further investigation. Young in down resemble those of the Common Sheldrake, but the brown of the upper parts is paler, and the white of the underparts is suffused with brown on the breast and belly.

Genus ANAS.

The genus *Anas* of the 'Systema Naturæ' of Linnæus (twelfth edition, i. p. 194) contained the Swans and the Geese as well as the Ducks. Brisson, in his 'Ornithologia,' restricted it to the Ducks, but, contrary to his usual custom, did not designate a type, unless we regard his first and fourth species, which he calls *Anas anas domestica* and *Anas anas fera*, as two forms of the typical species. Since Brisson's time no group of birds has suffered more from the hands of the genus-makers, who have literally made "ducks and drakes" of it to such an extent that there are very few species which have not been made the type of a *parvenu* genus by some ornithologist or other in his anxiety to split it up. These pseudo-genera may be all relegated to the waste-paper basket, with the exception of perhaps four or five, some of which can be admitted only on sufferance, to prevent the suppression of long-familiar names.

The restricted genus *Anas* will then consist of the well-defined group of non-diving Ducks, with the exclusion of the Sheldrakes, which may fairly be regarded as a very closely allied but distinct genus.

The narrow membrane attached to the hind toe distinguishes the birds in the genus *Anas* from all their allies except from the Sheldrakes. The latter are so closely allied to the non-diving Ducks that I am unable to find any external character to distinguish them beyond the prevalence of chestnut in the colours of the plumage and the white shoulder. The tail seems to be more rounded in the Ducks belonging to the genus *Anas*, the tarsus to be slightly shorter, and their habits somewhat different.

The flight of these Ducks is straight and very rapid; they swim with great ease, but rarely dive; and they walk somewhat clumsily. They breed near inland waters or swamps, but are often seen on the mud-flats of the coast in winter and on migration. They feed on both insects and plants. Their notes are harsh. They breed on swamps and moors, occasionally in an old nest in a tree, but never in holes in the ground.

With one or two exceptions the males are much more brilliant in colour than the females. These Ducks have only one complete moult in the year, but the drakes of most species, though not of all, moult their small feathers twice. As soon as the young are able to fly, the female moults all her feathers, beginning with the small ones and concluding with those of the wings and tail. The moulting of the male is quite different. As soon as the female has begun to sit, the male in most species has a complete moult, changing all his small feathers into an unobtrusive plumage,

resembling that of the female, in order that when he moults his wing- and tail-feathers (which he does last of all and all at once, so that for some time he is unable to fly) he can do so without bringing himself into danger by the brilliancy of his colour; but he does not wear this plain moulting-dress very long, at most not more than four months. Late in autumn the young moult out of their first plumage into that of birds of the year, which, in both sexes, resembles closely that of the adult, and the adult males moult out of their moulting-dress into their gay wedding-attire. In neither case, however (neither in the young of both sexes nor in the adult males), are the quills or tail-feathers moulted in autumn, except sometimes the two centre tail-feathers, which are often gaily coloured in the wedding-dress.

There are consequently six varieties of plumage belonging to each species of Duck in addition to the plumage of the young in down, namely: (1) young in first plumage, in which the sexes are alike, only slightly differing from females of the year; (2, 3) males and females of the year only slightly differing from adults; (4) adult male in moulting-plumage, only slightly differing from adult female; (5) adult male in wedding-plumage; and (6) adult female.

The genus *Anas* is almost cosmopolitan in its range. It contains about sixty species, of which a third breed in the Palæarctic and Nearctic Regions, a fourth in the Neotropical Region, the remaining species being nearly equally divided amongst the Ethiopian, Oriental, and Australian Regions. Eight species breed in Europe, all of which, with one exception, breed more or less commonly in the British Islands. Several American species occasionally wander in winter as far as our shores.

The following key will make it easy to distinguish any adult male British Duck in nuptial plumage belonging to this genus:—

A. Mantle vermiculated.

- Gadwall.
- Pintail ..... Upper breast white.
- Median wing-coverts white ..... Wigeon.
- American Wigeon
- Teal ..... Green band on sides of neck.
- White crescent on sides of breast. American Teal ....

B. Mantle not vermiculated.

- Shoulders blue ..... Garganey.
- Shoveller ..... Head and neck green.
- Mallard ..... Head and neck green.

The adult females may be distinguished as follows:—

Tail-feathers brown, obliquely barred with white	PINTAIL.	
	WIGEON.	
Wing 7 inches or less	GARGANEY*.	
	TEAL	Alar speculum black, more or less bronzed with green.
Bill at base only half greatest breadth	AMERICAN WIGEON	Alar speculum black, more or less bronzed with green.
	SHOVELLER	Alar speculum black, more or less bronzed with green.
	MALLARD	Alar speculum purple.

* Dresser has figured the female Garganey with a distinct alar speculum and blue wing-coverts; but the student will find that it is correctly described as not possessing those characteristics.

ANAS STREPERA.

GADWALL.

(Plate 64.)

Anas strepera, *Briss. Orn.* vi. p. 339 (1760); *Linn. Syst. Nat.* i. p. 200 (1766); **et auctorum plurimorum**—*Temminck, Wilson, Audubon, (Dresser), Saunders,* &c.
Anas cinerea, *S. G. Gmel. Reise Russl.* ii. p. 184 (1774).
Anas kekuschka, *S. G. Gmel. Reise Russl.* iii. p. 249 (1774).
Ktinorhynchus strepera (*Briss.*), *Eyton, Monogr. Anat.* p. 137 (1838).
Chaulodus strepera (*Briss.*), *Swains. Journ. Roy. Inst.* ii. p. 19 (1839).
Chaulelasmus strepera (*Briss.*), *Gray, Gen. B.* iii. p. 617 (1840).
Querquedula strepera (*Briss.*), *Macgill. Man. Brit. B.* ii. p. 169 (1840).

Owing to its excessive shyness and partiality for dense cover, the Gadwall is regarded as a much rarer visitor to the British Islands than is really the case. It is a winter visitor to the United Kingdom, but appears to have been introduced in several localities in Norfolk, where it is said to breed regularly. It occurs sparingly in winter in the Orkneys and Shetlands, on both the east and west coasts of Scotland, and on many of the Hebrides. It is a somewhat rare visitor to the coasts of England, and is said to be of much more frequent occurrence in many parts of Ireland than is generally supposed. It is found on inland sheets of water as well as those nearer the coast which afford plenty of cover.

The Gadwall is a circumpolar bird, but its range does not extend into the Arctic regions, though a few breed as far north as Iceland. It appears to be unknown in Norway, and is very sparingly distributed in South Sweden and the Baltic provinces*; thence its range extends eastwards through Southern Siberia to the Pacific coast, where it has occurred as far north as the Stanavoi Mountains, in lat. 60°. The southern limit of its breeding-range is the Spanish peninsula and the valley of the Danube, the northern shores of the Black Sea and the Caspian, and Northern Turkestan. A few remain to winter on the coasts of Holland, Belgium, France, Spain, and Portugal. In the basin of the Mediterranean and Africa north of the Desert it is principally known as a winter visitor. On the Asiatic con-

* The occurrence of the Gadwall as far north as Archangel, recorded by Dresser and Saunders, appears to me to be very doubtful. It is said to occur only accidentally on migration as far north as St. Petersburg; but there is no evidence that it breeds north of the Baltic provinces, and even there it is a very rare bird.

tinent it passes through Mongolia on migration, wintering in great numbers throughout India and more sparingly in North Burma, China, and Japan. On the American continent the Gadwall breeds in the northern United States, extending beyond them as far as Vancouver's Island, the basin of Lake Winnipeg, and Nova Scotia. It winters in the southern United States and Mexico. The nearest ally of the Gadwall is supposed to be a small tropical Duck (*Anas couesi*) inhabiting Washington Island, in the Pacific Ocean, about a thousand miles due south of the Sandwich Islands.

Although the Gadwall winters in this country, it must not be supposed for a moment that it is one of the arctic Ducks. To North Germany it is strictly a summer migrant, arriving late in March or early in April, and leaving again for its winter-quarters during October, a few only remaining a month later if the weather is not severe. It arrives in South Russia early in April and leaves about the middle of October, whilst in North India it appears in the last half of September and leaves by the end of March or early in April. The Gadwall usually migrates at night, often at a considerable height, and from time to time its call-note is uttered.

The Gadwall is a freshwater Duck and rarely frequents the coast. It is not very particular as to the choice of a haunt, and frequents the largest rivers as well as the small streams, extensive lakes, and small ponds. It loves the open water spaces as well as the tangled swamps where the water is hidden by rushes, reeds, and aquatic vegetation of all kinds. On small sheets of water and in rivers it usually occurs in parties of about a dozen birds, but on large lakes it often congregates in hundreds. It is not very active in the daytime, dozing on the banks, but leaves for its feeding-grounds at dusk. In districts where it is much persecuted it keeps far out in the open water, or skulks amongst the reeds; but in places where it is not much molested it may often be seen walking about the shore, or even feeding in the daytime in the shallow water. The Gadwall appears never to dive except when wounded; but in the shallows it often feeds with the head and upper part of the body hidden under the water and the tail upright in the air. Although shy and wary, it is a very sociable bird, and flocks with almost every species of wildfowl, even with Geese. It swims very lightly and buoyantly, and more rapidly than the Mallard, rising from the water when alarmed with little effort. Its flight is strong and powerful, and, when passing through the air, its long pointed wings make a peculiar whistling sound.

In India the food of the Gadwall is chiefly composed of wild rice, but in some localities the birds commit considerable depredations on the cultivated rice. According to season, it feeds largely on the seeds, leaves, and flower-buds of rushes and aquatic plants. This fare is also varied with insects, larvæ, small frogs, and worms; and Hume states that in India it often catches small moths and butterflies. Many water-weeds are pulled

up and brought to the surface, where the leaves and buds are pulled off at leisure.

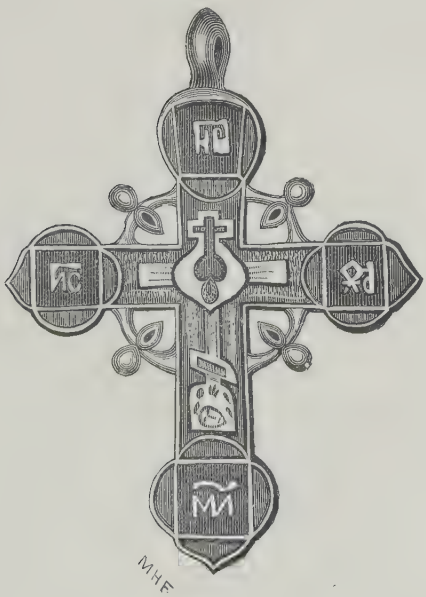
The call-note of the Gadwall is a *quack*, very similar to that of the Mallard, but weaker. When a flock of birds is feeding they often keep up a perpetual chatter.

The nest of the Gadwall is placed under some convenient bush, or beneath the shelter of a tuft of coarse grass or rushes, at no great distance from the water's edge. In rare instances it is made at some considerable distance from water. The nest is a mere depression in the ground, probably scratched out by the female, and lined with a little dry grass, bits of reed or rush, and, in some cases, with a few dead leaves. The eggs of the Gadwall are laid in May, frequently not before the end of the month. They are from eight to twelve in number, smooth in texture, and slightly glossy. They vary in length from 2·15 to 1·95 inch, and in breadth from 1·55 to 1·4 inch. In colour they do not differ from those of the Wigeon, being generally buffish white or cream-colour, though Naumann says that they are slightly tinged with olive; probably both types occur. The down resembles that of the Mallard, but is rather smaller, and differs from that of the Pintail in being darker and in having the white tips scarcely perceptible.

In winter, as in summer, the Gadwall prefers fresh water to the sea, and sometimes congregates in flocks of several hundreds on large pieces of water. Its flesh is excellent, especially, as Hume remarks, early in the season, when its diet is almost exclusively vegetable.

The Gadwall is intermediate in size between the Pintail and the Wigeon. The general colour of the upper parts of the male in nuptial dress is brown, barred and vermiculated with white, and gradually shading into black on the upper tail-coverts; the scapulars are margined with buff. The distribution of the colours on the wing is very unique; the first four secondaries are brown on the outer web; the second four, which form the centre of the speculum, are velvety black; and the third four are white; this tricoloured speculum is emphasized by the velvety black tips of the greater wing-coverts, which gradually shades into reddish chestnut on the median wing-coverts, and into grey on the shoulder. The upper breast is greyish black, with crescentic white bars; the underparts below the breast resemble the Pintail. Bill brownish black, tinged with yellow on the lower mandible; legs and feet orange-brown, darker on the webs; irides reddish brown. The general colour of the upper parts of the adult female is dark brown, each feather with a buff margin, except the scapulars, the feathers of the rump, which are brownish black, and the wings, which resemble those of the adult male, except that the reddish chestnut is confined to a few of the median wing-coverts. The general colour of the underparts is white, suffused with chestnut on the breast and flanks, which, together with the under tail-coverts,

are obscurely spotted with dark brown. Young in first plumage closely resemble the adult female, but there is no chestnut or black on the wings, the white on the secondaries is dull, and the whole of the feathers of the underparts have obscure, ill-defined, brown centres. Young males have narrower margins to the feathers of the upper parts. Males in their first nuptial plumage have very little black on the head, not so much chestnut as in the adult male, and the mantle is not so much vermiculated. Adult males in moulting-plumage resemble males in first plumage, but are distinguished by having the alar speculum of the adult and a few chestnut feathers on the median wing-coverts; in the colour of the mantle they are intermediate between adult males in nuptial plumage and young in first plumage, the feathers being brown, with a few narrow buff bars. The underparts closely resemble those of the young in first plumage, but the spots are smaller and more clearly defined. Young in down closely resemble those of the Mallard.



ANAS ACUTA.

PINTAIL.

(Plate 63.)

Anas longicauda, *Briss. Orn.* vi. p. 369 (1760).
Anas acuta, *Linn. Syst. Nat.* i. p. 202 (1766): **et auctorum plurimorum**—*Gmelin, Latham, Temminck, (Dresser), (Saunders)*, &c.
Anas alandica, *Sparrm. Mus. Carls.* iii. pl. 60 (1786).
Anas sparrmanni, *Lath. Ind. Orn.* ii. p. 876 (1790).
Anas caudacuta, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 38 (1816).
Dafila caudacuta (*Leach*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 127 (1824).
Trachelonetta acuta (*Linn.*), *Kaup, Natürl. Syst.* p. 115 (1829).
Anas caudata, *Brehm, Vög. Deutschl.* p. 869 (1831).
Phasianurus acutus (*Linn.*), *Wagl. Isis*, 1832, p. 1235.
Querquedula acuta (*Linn.*), *Selby, Brit. Orn.* ii. p. 311 (1833).
Dafila acuta (*Linn.*), *Eyton, Cat. Brit. B.* p. 60 (1836).
Querquedula caudacuta (*Leach*), *Macgill. Man. Brit. B.* p. 170 (1840).
Dafila acuta, *var.* americana, *Bonap. Compt. Rend.* xlii. p. 650 (1856).

The Pintail is best known as a winter visitor to the British Islands, but there can be scarcely any doubt that a few remain to breed. It appears only to pass the Shetlands sparingly on migration, but is said to be common in winter on the Orkneys. It has occurred in almost every county of Scotland, but is much rarer on the west than on the east coast, and has only once been known to stray to the Outer Hebrides. It is a tolerably frequent visitor to the east and south coasts of England, but appears to be rarer in the west. Sir Ralph Payne-Gallwey states that it does not frequent the north of Ireland, and is rarely met with on the large loughs of Antrim, Londonderry, Down, and Donegal; but south of Athlone it is not uncommon. He has observed it in large flocks on the estuaries of Clare, Connaught, and Kerry, and on Castle-Gregory Lake in co. Clare he has seen them in hundreds. Hancock states that it formerly bred on the now drained marsh of Prestwick Car in Northumberland; whilst, in Ireland, Sir R. Payne-Gallwey remarks that one or two pairs breed every year at Lord Castletown's Duck-preserves at Abbeyleix, in Queen's County; and that he has seen females with young broods on Loughs Mask and Corrib in co. Galway. They also probably breed on Lough Inagh in Connemara.

The Pintail Duck is a circumpolar bird, breeding in great numbers throughout the Arctic regions as far north as lat. 70°. South of lat. 60° it

breeds much more sparingly, but its eggs are occasionally taken in North Germany, Russia, and Siberia as far south as lat. 50°, and, it is said, in the Caucasus. It migrates both along the coasts and the great river-valleys, and winters throughout South Europe, Northern Africa, Asia Minor, Persia, India, and Ceylon. It passes through Turkestan and Mongolia on migration, and winters in Burma, China, and Japan. On the American continent it breeds in the same latitudes as in the Old World, and is found in winter throughout the Southern States, Mexico, and Central America. It has no very near ally.

The long neck and long pointed tail give to the Pintail a somewhat more slender appearance than that of most of its kind. It belongs to the fresh-water group of Ducks, breeding in the midst of moors, lakes, rivers, and swamps, but on migration and in winter spending most of its time on the sea-shore, to feed on the mud-flats at low tide. It is one of the earliest Ducks to arrive in spring, and one of the latest to leave in autumn. If the ground be not covered with snow, it makes its appearance in North Germany about the middle of March, and passes through again during the month of October, remaining in November until it is frozen out. In its habits it most closely resembles the Mallard, feeding, like the other freshwater Ducks, partly on insects and mollusks, and partly on the ends of grass and the buds of water-plants, but, like the Mallard, it frequents the stubble-fields in autumn to pick up the fallen grain. Its voice closely resembles that of the Mallard and Shoveller, but on the whole it is a silent bird. This may be accounted for by its extreme wariness: it takes such great care to avoid danger, that its alarm-note of *quaak* is not often required. Its call-note is a low *kah*; and Naumann says that, in the pairing-season, the male may be seen swimming round the female uttering a deep *clük*, which, if the observer be fortunate enough to be sufficiently near to hear it, is preceded by a sound like the drawing-in of the breath, and followed by a low grating note.

When Harvie-Brown and I were at Ust Zylma, on the banks of the Petchora, waiting for summer to come, we saw one of the most interesting episodes in the history of migration that I have ever witnessed. The river Zylma enters the Petchora opposite the village, and when the melting of the snow in the valley of the Upper Petchora causes the great river to rise, its waters flow up the little stream, which overflows its banks, floods the low-lying meadows in many places, and forms little lakes and small fjords or *couriers* of open water a week or more before the ice breaks up. The Sessedatel of Ust Zylma, Mons. Znaminski (one of the few Russian officials who deserves the honourable title of gentleman, and who has since, I am happy to hear, been promoted to be Ispravnik of Ust Ishma), had a shooting-box some miles up the river, and invited us to join him and the Postmaster in an expedition to shoot *outka* or Ducks. On the 19th of May we hired a

sledge and joined our host and his friend, crossed the great river (a mile and a half) over the snow on the ice, and reached the wooden house after some adventures among the melting snow-fields. Early the next morning the sight that presented itself to our view was a most interesting one. As far as we could see, the strip of open water on each side of the ice in the Zylma was black with Ducks, and overhead Ducks were flying about in every direction like a swarm of bees. To estimate the number at half a million would probably be to guess under the mark. They were almost all of them Pintails, but many Teal and Wigeon were among them. In spite of their enormous numbers they were wild enough. We had no difficulty in watching them through our glasses so as to identify the species; but when it came to getting within shot, we found the only way was to conceal ourselves behind a willow-stump and take them as they flew over. After the weary waiting for summer to come, with comparatively few birds to watch except the flocks of Snow-Buntings, Shore-Larks, and Lapland Buntings, it was most exciting to find ourselves in the midst of such abundance of bird-life; nor was the prospect of unlimited roast duck by any means to be despised after a month's diet of salt beef. We did not, however, enjoy it long on this occasion, for on the morning of the next day we were startled to find that our road on the ice of the Zylma had broken up into pack-ice, and was steadily marching down to the Petchora. We were obliged to desert our baggage, and, after a forced march to the mouth of the river, were fortunate enough to find a boat waiting for us, which, thanks to the important position of our host, had been sent across the ice to our rescue. As we crossed the ice we could hear it cracking like thunder under our feet; and the next morning we found that the ice on the great river had broken up, and we were effectually cut off from our baggage and the Pintails by a mass of rapidly drifting pack-ice, which continued to march past for five days.

As soon as the snow had melted, the Ducks, or those of them which remained, began to breed. The nests of the Pintail were placed in the grass among the shrubs in dry places, generally at some distance from the water; they were deep, and well lined with dead grass and sedge, and, when the full clutch was laid, contained plenty of down. We took the first eggs on the 5th of June. In Germany, where a few Pintails remain to breed, eggs may be taken early in May. Seven to nine, or sometimes ten, is the full number, but where the first eggs are taken the second clutch only contains five or six eggs. They are pale buffish green in colour, and vary in length from 2·25 to 2·0 inch, and in breadth from 1·6 to 1·5 inch. It is impossible to distinguish them from eggs of the Long-tailed Duck, or from small and exceptionally green eggs of the Mallard. The down is, however, a tolerably safe guide to their identification, being of the same size as that of the Mallard, but distinctly tipped with white,

though not quite so much so as that of the Shoveller or Wigeon. The down of the Long-tailed Duck has no white tips, and is quite as small as that of the Teal, though paler and browner in colour. The down of the Pintail is brown, like that of the Long-tailed Duck and Wigeon, whilst that of the Mallard and Shoveller is an almost neutral dark grey.

In its winter-quarters in India the Pintail principally frequents large open sheets of water, being especially fond of those which contain masses of weed, amongst which it delights to hide during the day; it also resorts to the coast, frequenting salt as well as fresh water. It is very gregarious, and sometimes gathers into flocks of several thousands. Hume observed that large flocks composed entirely of males were continually met with. Its food consists largely of wild rice, and it is also extremely partial to small fragile freshwater shells. It is regarded as one of the best Ducks for the table.

The Pintail is somewhat intermediate, both in size and colour, between the Mallard and the Wigeon. The head and neck are brown, with very faint green and purple reflections, shading into almost black on the nape and hind neck; the white on the lower neck extends over the whole breast, and reaches up the side of the neck as far as the nape. The back is greyish white, vermiculated with nearly black; the wing-coverts are pale grey; the scapulars and upper tail-coverts are glossy black, with pale margins and longitudinal stripes; the alar speculum varies from bronzy green to buffish purple, according to the light in which it is held, and is emphasized by the chestnut-buff tips of the greater wing-coverts, and by narrow black subterminal and white terminal bands across the secondaries. The two centre tail-feathers are black, glossed with purple and green, and are narrow, truncated, and lengthened two inches or more beyond the rest; the flanks and belly are white, finely vermiculated with dark grey, and the under tail-coverts are nearly black. Bill dark slate-grey, black on the centre of the upper mandible; legs and feet slate-grey; irides dark brown. The general colour of the upper parts of the adult female, as in the other species in this genus, is dark brown, most of the feathers being margined with nearly white, except on the head and scapulars, where they are striped with buff. The greater wing-coverts and the secondaries are tipped with white, forming two white bars across the wing; but the space between them is dull brown, mottled with black, without any metallic gloss of any kind. The general colour of the underparts is greyish white, each feather with a brown centre, darkest on the upper breast. The female of this species may always be recognized by the oblique bars on the tail-feathers. Young in first plumage closely resemble adult females, but young males may always be distinguished by having an alar speculum. Males in first nuptial plumage have pale margins to the wing-coverts, and most of the feathers of the rump are broadly barred, instead of finely vermiculated, with white. Adult males in

moulting-plumage may be distinguished from adult females by having an alar speculum, and being richer and darker in colour. Young in down have the same pale spots on the upper parts as those of the Mallard, but the white on the throat and belly is slightly suffused with grey instead of buff, and in addition to the dark line passing through the eye, a second dark line passes from the lores below the eye to the nape.

ANAS PENELOPE.

WIGEON.

(Plate 63.)

Anas fistularis, *Briss. Orn.* vi. p. 391 (1760).
Anas penelope, *Linn. Syst. Nat.* i. p. 202 (1766); **et auctorum plurimorum**—*Temminck, Naumann, (Dresser), (Saunders)*, &c.
Anas cogolca, *S. G. Gmel. Reise Russl.* i. p. 70 (1770).
Anas kogolca, *S. G. Gmel. Nov. Com. Petrop.* xv. p. 468, pl. 21 (1771).
Mareca fistularis (*Briss.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 131 (1824).
Mareca penelope (*Linn.*), *Selby, Brit. Orn.* ii. p. 324 (1833).

The Wigeon is one of the best-known and most plentiful of the Ducks that regularly visit the British Islands in winter. It is found not only on the coast, but on the lakes, bogs, and marshes of the inland districts, though it is most abundant on tidal waters. It leaves for the north in April, but a few remain behind to breed, and have been observed doing so in the shires of Ross and Sutherland, in Cromarty, and in the Orkneys and Shetlands. It has been said to breed in the Western Islands, but confirmation of the fact is wanting. It has never been actually found breeding in Ireland, but very probably does so in the most secluded places; it has, however, bred in a state of semi-domestication at Lord Sligo's seat. It has never yet been proved to breed in a wild state in England, but has been strongly suspected to do so in Norfolk.

The Wigeon is a very common Arctic species of Duck confined to the Old World during the breeding-season. South of lat. 60° it is only found breeding under exceptional circumstances; but I have taken its eggs in the lower valley of the Danube, and nests have been taken in France, Germany, Denmark, Bohemia, and in the Baikal basin. It occurs on passage in the Faroes, but breeds in Iceland, and is an accidental visitor to Greenland and the Atlantic coast of North America; it also visits the American continent at the eastern limit of its range, being not unfrequent in winter on the Pacific coast from Alaska to California. It passes through Central Europe, Turkestan, and Mongolia on migration, and winters on the southern shores of the North Sea, the coasts of France and Spain, Madeira, throughout the basins of the Mediterranean, Black, and Caspian Seas (ranging in North-east Africa as far south as Abyssinia), India, Burma, China, and Japan, being especially abundant in the two latter countries. It is represented in the New World by the American Wigeon, a very distinct bird, which is treated of in the next article.

The Wigeon has probably derived its name from its remarkable note, but,

as is usual in cases of this kind, it requires a considerable stretch of imagination to recognize the similarity. The cry of this Duck is a loud prolonged whistle or scream, immediately followed by a short note. I can best represent it by the syllables *mee-yu*, the first very loud and prolonged, the last low and short. It sounds very wild and weird, as it startles the ear on the margin of a mountain-tarn or moorland lake, a solitary cry, very high in key, not unmusical in tone, but loud and piercing, one of the most familiar sounds on the banks of the Petchora and the Yenesay, where the Wigeon is very abundant, especially on the lakes and swamps of the borderland where the forest merges into the tundra not far north of the Arctic circle. The Wigeon has other notes which are not so often heard; one may be represented by *kr-r* and is not unlike the note of the Tufted Duck, and Naumann says that when suddenly flushed it utters a note like that of the Shoveller.

The Wigeon is a very gregarious bird, and on migration sometimes collects into flocks of enormous size. In the breeding-season it consorts with Teal, Pintail, Scaup, Scoter, and other Ducks which breed in the high north, and delights in wild wet country where the forests are almost overpowered by swamps, lakes, rivers, bogs, and meadows, and where it can find abundance of both animal and vegetable diet in the insects in all stages, the mollusks, and the buds and seeds of various water-plants. On migration it is specially fond of the sea-coast, frequenting the mud-flats at low tide, and repairing to inland sheets of water where such are to be found to feed upon the grass-wrack. The Wigeon arrives on its breeding-grounds at the earliest possible moment. In these high latitudes summer treads rapidly on the heels of winter: the ice on the great rivers breaks up at the rate of four miles or more an hour, and as soon as any open water is visible it is quickly crowded with thousands of Pintail, Teal, and Wigeon. This rate of progress may not sound very rapid, but a thousand miles in ten days cannot be called slow. The Wigeon are impatient to arrive at their old homes; before March with its many weathers is over, the earliest arrivals make their appearance in North Germany, and throughout April flock after flock follow the coast or the courses of the great rivers on their way north. Those which remain to breed in South Scandinavia and South Finland begin to lay in the latter half of May, but on the Arctic circle they are, of course, later. On the banks of the Petchora the Wigeon arrived on the 19th of May, and eggs were obtained on the 5th of June; but in the valley of the Yenesay I saw the first bird on the 6th of June and found eggs twelve days later. The nests are well concealed, generally close to the margin of a lake or a pond, and are placed in the long grass and sedge, often under a willow bush. Like those of most Ducks which breed in the Arctic Region they are very deep, well lined with dead grass and sedge, and when the full clutch is laid contain a

quantity of down with which the eggs are covered when the female leaves the nest. The down of the Wigeon may very easily be recognized by its sooty-brown colour and by the distinctness of the white tips—an important point in discriminating the eggs from those of the White-eyed Pochard and Gadwall, which are about the same size and nearly the same colour, though much less of a creamy white, more inclined to dull buffish white, whilst the down which surrounds them is darker, greyer, and almost without pale tips. The eggs of the Wigeon vary in number from seven to ten, in rare instances to twelve; they are buffish white or cream-colour, and never show the slightest trace of olive. They vary in length from 2·3 to 1·9 inch, and in breadth from 1·6 to 1·3 inch. Large eggs of the Wigeon are absolutely indistinguishable from eggs of the Smew; but the pale grey down of the latter bird and the position of its nest in a hole or under a log of wood effectually prevent any mistake, even if the bird has not been identified.

The Wigeon is a bird of rapid and almost noiseless flight, and is very shy, especially when collected in large flocks, which are almost impossible to approach. According to Naumann the duck sits from twenty-four to twenty-five days; for about half this period she is attended by the drake, who roosts during the day not far from the nest, and faithfully accompanies his mate every evening to the feeding-grounds; but long before the eggs are hatched, either his ardour has cooled or important business calls him elsewhere, and he leaves her to bring up her brood alone, whilst he retires into the marshes to undergo his first moult. As soon as the young are able to fly the female leaves them to fight their own way in the world, whilst she undergoes her one annual and complete moult in the most retired locality she can find. As soon as frosts begin the Wigeon leaves its breeding-grounds for the south. The month of October is the period of the autumn migration in North Germany, but an early winter in the north will often bring them before the end of September, and if the weather be not severe, a few remain until they are driven south by the frosts of November.

In its winter-quarters in India the Wigeon not only frequents the coasts, but resorts to large sheets of water, especially those where the shores are covered with smooth turf. At this season grass and freshwater shells are its principal food. It feeds more by day than the Pintail, and does not so frequently change its ground as that bird.

The adult male Wigeon in nuptial dress has the head and neck chestnut, shading into black on the chin and throat and into buff on the forehead and crown. The back and scapulars are white, finely vermiculated with dark grey; the innermost secondaries are nearly black with white margins to the outer webs, and the longest upper tail-coverts are nearly black with pale margins to the inner webs; the wing-coverts are white except at the

shoulder, where they are brown vermiculated with white; the alar speculum is glossy green, broadly emphasized on each side with black. The upper breast is chestnut-grey, the under tail-coverts are black, and the rest of the underparts are pure white, vermiculated with dark grey on the flanks. Bill slate-grey, black at the tip; legs and feet greyish blue, darker on the webs; irides hazel. The adult female Wigeon is much greyer in colour than the female of most of the Ducks, and the pale margins to the feathers are very obscure except on the upper tail- and wing-coverts, where they are narrow but clearly defined and pure white. On the head, neck, upper breast, and scapulars the pale margins are much broader and buffish brown, the lower breast and belly are pure white, the flanks brownish buff, and the under tail-coverts white barred with dark brown; the speculum is greyish brown without any gloss. Young in first plumage do not conspicuously differ from the adult female; but the males may always be recognized by the metallic-green alar speculum, and the females by the grey and white of the upper parts being replaced by brown and buff. Males in first nuptial dress have very little black on the chin and throat, but the forehead and sides of the head are spotted with black, and many of the feathers on the upper breast are barred with brownish black. Adult males in moulting-plumage are more brilliantly coloured than usual, the principal difference being that the black and white vermiculated upper parts are changed to dark brown barred with chestnut and buffish white, which is also the colour of the upper breast, whilst the flanks are nearly uniform chestnut. Young in down are almost uniform brown on the upper parts, with less distinct pale spots than are usually found in this genus; on the underparts they are very buff, approaching chestnut on the throat, but the dark stripe through the eye, so conspicuous in the young in down of the Mallard, is absent.

ANAS AMERICANA.

AMERICAN WIGEON.

(Plate 63.)

Anas americana, *Gmel. Syst. Nat.* i. p. 526 (1788); **et auctorum plurimorum—** *Wilson, Audubon, (Baird, Brewer, & Ridgway)*, &c.
Mareca americana (*Gmel.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 135 (1824).

The American Wigeon belongs to the list of doubtful British birds: there is reasonable ground to suppose that it has been shot more than once in our islands, but it is impossible to prove that the birds had not escaped from confinement. The undoubted occurrence of American Sandpipers on our shores makes the occurrence of American Ducks, which are so much more at home on the water, more than probable; and as the American Wigeon is not one of the species usually introduced into an English park, we may give it the benefit of the doubt, and regard it as a rare accidental visitor.

During the winter of 1837–38 an adult male American Wigeon was bought in the flesh in Leadenhall Market by Mr. Bartlett, the present Superintendent of the Zoological Gardens in Regent's Park (Yarr. Hist. Brit. B. iii. p. 293). This example may possibly have been sent over from Holland; it is now in Mr. J. H. Gurney's collection.

The second reputed occurrence of this bird in our islands is recorded (Edward, 'Zoologist,' 1860, p. 6970) as a male shot on the Burn of Boyndie, in Banffshire, in January 1841.

In 1844, towards the end of February, a third supposed example, said to have been an adult male, was shot on Strangford Lough, near Belfast; and, although the specimen was not preserved, the description given of it by the professional sportsman who shot it appears to have convinced a competent authority not only of the correctness of the identification of the example in question, but of the fact that immature birds of the same species had previously been killed in Belfast Bay (Thompson, 'Birds of Ireland,' iii. p. 112).

A fourth record of a female shot on the Essex coast in January 1864 (Carter, 'Zoologist,' 1864, p. 8962) requires the identification of some competent authority before it can be accepted.

A fifth record is still more unsatisfactory, apparently resting only on hearsay evidence, alleging that a specimen was shot, about the 20th of

April 1870, on the Taw, in Devonshire (Mathew, 'Zoologist,' 1870, p. 2182). It is said to have once occurred in France.

The American Wigeon breeds in Alaska and in British America as far north as lat. 70°, and its eggs have occasionally been taken in the extreme north of the United States. It winters in the Southern States, the West Indies, and Mexico.

It scarcely differs in its habits from its Old-World ally, and lays eggs of the same creamy-white colour, which vary in length from 2·25 to 2·1 inch and in breadth from 1·55 to 1·45 inch.

The adult male American Wigeon differs from its European ally in many important points. In both species the white on the forehead extends far on the crown, but the rest of the head and the neck are chestnut in the European species and nearly white in the American. In the latter species there is also a broad metallic green stripe on the side of the head extending from the eye to the neck, in which respect it resembles the Teal; but in many European skins traces of this metallic stripe are visible. A more important distinction is to be found in the colour of the back and flanks, which in the European bird are vermiculated with black on a white ground, whilst in the American bird they are vermiculated with black on a vinous ground of nearly the same shade as the breast. The female American Wigeon has a velvety black alar bar, but otherwise it very closely resembles the female of the European Wigeon. A further characteristic of the American species, apparently showing its affinity with the Teal, is that at all ages and in both sexes the axillaries are pure white, with only very slight indications of mottling near the tips. The latter character is the best distinction between adult female American Wigeons and young males in first plumage of the European species. Males of the year have only very indistinct traces of the bronze-green band on the sides of the head, and the throat is much more profusely spotted; but they may at once be distinguished from a similar plumage of the Old-World Wigeon by the new feathers of the back being vermiculated with vinous and black, instead of white and black. Young in first plumage may be distinguished from those of the Common Wigeon by the presence of a metallic alar speculum. Young in down scarcely differ from those of the Common Wigeon.

ANAS CRECCA.

COMMON TEAL.

(Plate 66.)

Anas querquedula minor, *Briss. Orn.* vi. p. 436 (1760).
Anas crecca, *Linn. Syst. Nat.* i. p. 204 (1766); et auctorum plurimorum—*Gmelin, Latham, Temminck, (Dresser), (Saunders),* &c.
Querquedula crecca (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 146 (1824).
Nettion crecca (*Linn.*), *Kaup, Natürl. Syst.* p. 95 (1829).
Querquedula subcrecca, } *Brehm, Vög. Deutschl.* pp. 885, 886 (1831).
Querquedula creccoides, }

There can scarcely be any reasonable doubt that the Teal is more closely allied to the Wigeon than to the Garganey, whose true affinities are with the Shoveller*. The Teal can only be regarded as a dwarf Wigeon, and is still more closely related to the American race of that species. It is impossible to doubt that natural selection would alter the shape of the bill to suit the nature of the food much easier than sexual selection would produce two similar arrangements of colour in birds belonging to different subgenera.

The Teal is a local resident throughout the British Islands, and breeds sparingly in suitable localities in almost every part, but is more common in the northern districts than in the southern. In winter its numbers are largely increased by migrants from the north, and at the two seasons of passage many birds pass along our coasts to and from their winter-quarters. Great numbers frequent the coast, but many retire inland to the rivers, lakes, and swamps, migrating southwards on the approach of very severe weather.

The Teal is an arctic and semi-arctic Duck, confined to the Old World, except that it is an accidental visitor on migration to Greenland and the

* Not only is the coloration of the wing and scapulars nearly the same in the two latter species, but the relationship is further indicated by the white crescent in front of the eye of the Blue-winged Teal of America (admitted to be a Garganey), a character which reappears in the Australian and New-Zealand Shovellers. The similarity in colour between the eggs of the Garganey and Teal can scarcely be regarded as denoting very close relationship, any more than the still greater similarity between the eggs of the Wigeon and the Smew. Nor can the slight difference in the colour of the eggs of the Garganey and Shoveller be regarded as denoting distant relationship any more than the remarkable difference between the eggs of the Goosander, Red-breasted Merganser, and Hooded Merganser, birds which are, unquestionably, very closely allied.

Atlantic coasts of North America. It is a regular summer visitor to Iceland, and passes the Faroes on migration. It breeds in great numbers throughout Northern Europe and Asia as far north as lat. 70°. South of the Arctic circle it is much rarer, though it breeds on the Azores and Madeira, very rarely in South Europe, but more commonly in Holland, Germany, Denmark, and South Scandinavia. In Turkestan, Mongolia, and the valley of the Amoor it is principally known on migration, but a few remain to breed. It winters sparingly on the coasts of Europe south and west of the Baltic, but more abundantly in the basin of the Mediterranean, occurring in North-west Africa as far south as the Canary Islands, and in North-east Africa as far south as Abyssinia. It also winters in the basins of the Black and Caspian Seas, and in Persia, India, Ceylon, Burma, China, and Japan. In Eastern Siberia the Common Teal is partially replaced by the Baikal Teal, *Anas glocitans*, an allied species, principally differing in having no chestnut on the head, which winters in Eastern India, China, and Japan. On the American continent our Teal is represented by a still more closely allied species, the American Teal (*A. carolinensis*), which, as it has occurred in the British Islands, will be treated of in the following article.

The Teal is no exception to the rule that the larger a bird is the more timid and wary are its actions. It is the smallest European Duck and at the same time the tamest. It often swims in and out amongst the reeds, fearlessly allowing itself to be watched at a comparatively short distance, but once on the wing it almost rivals the Garganey in the dashing rapidity of its flight. Although it migrates far into the Arctic regions, where it arrives with the first flights of migratory Ducks, before the rivers have been broken up into pack-ice, breeding much further north than the Mallard, it is less courageous than the larger species in braving the storms and snows of winter. In Germany the Teal is almost as rare in winter as in summer; probably a few scattered pairs remain to breed in most summers, and in mild winters it occasionally remains in sheltered situations; but during the two periods of migration it is a very common and widely distributed bird. The spring migration in North Germany lasts from the 1st of March to the 1st of May, and that of autumn from the end of September to the middle of November. Its habits differ very little from those of its congeners; perhaps it might be said that the Teal is more partial to small reedy ponds and less fond of visiting the mud-banks on the sea-shore than its relations; but its food is the same mixture of animal and vegetable substances. Its quack or alarm-note is very similar to that of the Garganey, and may be represented by the syllable *knake*; but the call-note of both sexes is a sharp *krik*, and in the pairing-season the drake utters a harsh grating note. It is quite as gregarious as its congeners, and sometimes on migration the flocks of Teal are very large. Like the Wigeon and the Pintail, the Teal

loves to breed amongst the scattered trees in the low-lying forest-swamps and on the banks of the lakes and *couriers*, as the little freshwater fjords of Siberia are called, up in the north near the Arctic circle. The nest is sometimes concealed amongst the rushes, often hidden in a clump of bilberries or under a willow bush. The first egg is laid early in May in North Germany, and even in the Arctic regions it loses no time, as eggs may be taken a week after the ice has broken up and before it has all marched down to the sea.

The nest resembles that of most other Ducks, and contains from eight to ten buffish-white or cream-coloured eggs, in very rare instances with the faintest possible tinge of green, which vary in length from 1·8 to 1·6 inch, and in breadth from 1·4 to 1·3 inch. As a rule they are slightly smaller than those of the Garganey; but they can only be distinguished with certainty by the down, which is small and without any white tips, and scarcely distinguishable from that of the Long-tailed Duck, except that it is slightly darker and not so warm a brown.

The Teal seldom sits more than three weeks; but this species is said to be so little shy that the drake takes part in the care of the young until they have feathers, when he leaves them in charge of his mate whilst he retires to assume his brown moulting-dress.

The Teal is the smallest British Duck and only weighs about a third as much as the Mallard. The general colour of the head and neck of the adult male in nuptial dress is chestnut, but the chin is black; a broad stripe runs from the eye down the sides of the neck, which varies from emerald-green to purple, according to the light in which it is held; this green stripe is narrowly margined with white on the sides of the head, which runs down to the base of the bill. In the finely vermiculated back and innermost scapulars the Teal closely resembles the Wigeon, but in the white longitudinal stripes on the outermost scapulars it presents a marked contrast to that bird, though somewhat resembling the Shoveller. The wings of the Teal very closely resemble in colour those of the Pintail, having the same grey coverts, and the alar speculum (which, however, is much more brilliant and emphasized by a broad velvet-black margin to the adjoining secondaries) varies from emerald-green to reddish purple, but is always of the opposite colour to that of the Pintail when the light falls on the two wings in the same direction. The upper breast is white, spotted with black, the rest of the underparts scarcely differing from those of the Wigeon and Pintail; but the outer tail-coverts are buff, rendered specially conspicuous by velvety black bases. Bill nearly black; legs and feet greyish brown; irides hazel. The general colour of the upper parts of the adult female is dark brown, every feather edged, and many obscurely barred, with grey, except the scapulars, which are edged with buff, and the wings, which are similar in colour to those of the adult male, but somewhat

duller, and have the innermost secondaries less elongated. The general colour of the underparts is white, with obscure dark brown centres to all the feathers except those of the belly. Young in first plumage closely resemble the adult female, but the dark centres of the feathers are more conspicuous on the underparts and on the wing-coverts. In this plumage males are difficult to distinguish from females, but the latter are somewhat paler in colour and have a less brilliant speculum, and the black on the adjoining innermost secondaries is dull. Males in their first nuptial dress are not quite so brilliant in colour as fully adult males, but the differences are very unimportant. Males in moulting-plumage closely resemble adult females, but retain their brilliant alar speculum and the deep velvety black of the adjoining innermost secondary. Young in down closely resemble those of the Mallard, but the dark spot on the ear-coverts is prolonged into a dark streak, which joins the dark streak through the eye on the sides of the neck.

NEST OF TEAL.

ANAS CAROLINENSIS.

AMERICAN TEAL.

Anas crecca varietas, *Forster*, *Phil. Trans.* lxii. p. 419 (1772).
Anas carolinensis, *Gmel. Syst. Nat.* i. p. 533 (1788); **et auctorum plurimorum—** *Audubon*, (*Coues*), (*Baird, Brewer, & Ridgway*), &c.
Anas americana, *Vieill. Enc. Méth.* p. 155 (1823).
Querquedula carolinensis (*Gmel.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 128 (1824).
Nettion carolinensis (*Gmel.*), *Baird, Cassin, & Lawrence, B. N. Amer.* p. 777 (1859).

The American Teal is often called the American Green-winged Teal, to distinguish it from the so-called American Blue-winged Teal, which is not a Teal but a Garganey. It is admitted into the British list because it has occurred twice, and possibly three times, in our islands; but it can only be doubtfully regarded as an accidental visitor to Britain, inasmuch as the practice of importing wildfowl to be kept in a state of semi-domestication on ornamental sheets of water in parks and gardens is so general.

The earliest alleged occurrence of the American Teal in England is that of an example shot about the year 1838 at Huntbourne Park, in Hampshire (Fellowes, 'Zoologist,' 1880, p. 71); some doubt, however, rests upon the correctness of the identification. The second example is said to have been killed near Scarboro', in November 1851 (Evans, 'Zoologist,' 1852, p. 3472). Mr. Evans informs me that this bird was an adult male, that it differed markedly from the Common Teal in the absence of the line of light buff on the sides of the head, that it was identified as the American Teal by Meyer, and that it is now in the collection of Lord Hill at Hawkestone, near Shrewsbury. The third example was shot on the 23rd of November, 1879, on an arm of the Kingsbridge Estuary, South Devon (Nicholls, 'Zoologist,' 1880, p. 70); it is described as a male, with plain scapulars and a conspicuous white crescent on the side of the body, just in front of the bend of the wing.

The distribution of the American Teal on that continent is very similar to that of the Common Teal in Europe and Asia. Its principal breeding-grounds are in the Arctic regions from Alaska to Greenland, whence it migrates in autumn to winter in the Southern States, Mexico, Central America, and the West Indies. In South Canada and in the Northern States it is principally known as passing through on migration in spring and autumn; but in favourable localities a few remain to breed, and in mild winters are seen throughout the year. In the Aleutian Islands (as the allied species in the British Islands) it is a resident, but its numbers

are greatly increased by migrants in the winter. It is an occasional autumn visitor to the Burmudas.

It is probable that the Teal was a circumpolar species during the last interglacial period, and that the Nearctic and Palæarctic Teals have become differentiated at a comparatively recent period, since the Arctic ice-fields have driven them far enough south to make the areas of their distribution discontinuous. So long as they all bred near the Arctic Ocean and on the islands within it, constant interbreeding would cause any change to be universal; but as soon as the Nearctic Teals became isolated from the Palæarctic Teals, and each colony could only interbreed within itself, the changes would be sure to follow different lines, and soon result in the separation of the Teals into two closely allied species.

The habits of the American Teal are described as precisely the same as those of our bird. It chooses the same localities, both in its winter-quarters and at its breeding-grounds. It is not known that the nest or eggs differ in any way. The latter are creamy white in colour, and vary in size from 1·85 by 1·35 inch to 1·75 by 1·3 inch.

The American Teal closely resembles its Euro-Asian ally, but the white line which encircles the green patch on the side of the head, and passes down to the base of the bill, is almost obsolete; the scapulars are uniform pale slate-grey, and there is a broad white crescent on each side of the breast in front of the shoulder.

The variations attributable to age and season are said to be very similar in both species, and Baird, Brewer, and Ridgway state that the female of the European Teal is not distinguishable with certainty from that of the American Teal. Young in first plumage of the two species are also indistinguishable. Males of the year may be distinguished by the white crescent on each side of the lower breast. Young in down are described by Baird, Brewer, and Ridgway as resembling those of the Mallard in having the dark spot on the ear-coverts disconnected from the loral streak.

ANAS CIRCIA.

GARGANEY.

(Plate 66.)

Anas querquedula, *Briss. Orn.* vi. p. 427 (1760); *Linn. Syst. Nat.* i. p. 203 (1766).
Anas circia, *Linn. Syst. Nat.* i. p. 204 (1766); **et auctorum plurimorum**—*Gmelin, Latham, (Bonaparte), (Dresser), (Saunders)*, &c.
Querquedula circia (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 143, pl. 51 (1824).
Querquedula glaucopteros, Querquedula scapularis, } *Brehm, Vög. Deutschl.* pp. 882, 883 (1831).
Cyanopterus circia (*Linn.*), *Eyton, Monogr. Anat.* p. 130 (1838).
Pterocyanea circia (*Linn.*), *Bonap. Cat. Met. Ucc. Eur.* p. 71 (1842).

The Garganey is a somewhat scarce and very local visitor to the British Islands on migration, breeding sparingly in one or two favoured districts. It is a rare visitor to Scotland and to Ireland; but it would doubtless breed in the latter country if not molested. It nests regularly in Norfolk, where it is thought to be increasing in numbers, and it formerly bred in the fens of Cambridge and Huntingdon before they were drained. It is not improbable that it may breed in several localities in the southern counties of England, where it is known as a rare spring visitor. It has several times been observed in the Shetlands on the autumn migration.

The geographical distribution of the Garganey is a somewhat peculiar one. It appears to be only an accidental visitor to Iceland and the Faroes, and there are only two instances of its having occurred in Norway; but it breeds in some numbers in Denmark, Sweden, the Baltic Provinces, Finland, and North-west Russia as far as Archangel. Harvie-Brown and I saw nothing of it in the valley of the Petchora, and in Siberia it appears to be confined to the extreme south. It breeds more or less abundantly throughout Southern Europe, the Caucasus, and Turkestan, and a few are said occasionally to remain to breed in India, Burma, and China. Its winter-quarters are the basins of the Mediterranean, Black, and Caspian Seas, India, Burma, Java, Celebes, the Philippines, China, and Japan. On the American continent the Garganey is represented by two allied but perfectly distinct species—the Blue-winged Teal (*Anas discors*) and the Cinnamon Teal (*A. cyanoptera*). Both species may be distinguished by their black under tail-coverts; the former has a large white crescent between the eye and the bill, and the latter has a uniform chestnut head and neck, without any white streak. The female Blue-winged Teal may be distinguished from the female Garganey by having an alar speculum which is bronzed with green. The Blue-winged Teal has been included in the British list on the faith of four alleged occurrences. The first of these (Evans, 'Zoologist,' 1852, p. 3472) was intended to refer

to the American Green-winged Teal (*A. carolinensis*). The second (Gibson, 'Naturalist,' 1858, p. 168) was probably that of a Garganey, shot near Dumfries early in 1858. The third (Gray, 'B. West of Scotland,' p. 373) is more satisfactory: the bird was shot in Dumfriesshire, in January 1863, by a Mr. Shaw, and passed through the hands of a bird-stuffer into the collection of Sir William Jardine. Saunders appears to have ascertained that there is an error of five years in the date; and he has satisfactorily disposed of the last alleged occurrence of this bird (Nelson, 'Zoologist,' 1882, p. 92) at Redcar, the example proving on examination to be an immature Garganey. The egg of the Blue-winged Teal is indistinguishable from that of the Garganey.

The Garganey differs very slightly in its habits from the other freshwater Ducks, but it has some slight peculiarities of its own. It is one of the species which are more susceptible to cold than others of its congeners; it does not venture into the high north, and even in Germany it seldom arrives from its winter-quarters before April, and disappears again before the November frosts have begun. Though widely distributed, it cannot be regarded as a very common species; and though it is as gregarious as its relatives, it is not seen in such large flocks as many of them are. It is one of the least shy of the European Wild Ducks, and allows itself frequently to be approached within gunshot; but it is partly compensated for its tameness on the water by the wonderful swiftness of its flight in the air, in which it is surpassed by none of its congeners. Although its flight is so rapid, it is almost noiseless; and in other respects the Garganey is a somewhat silent bird. Its quack is not so loud as that of the Mallard, but is in a slightly higher key; it may be represented by the syllable *knake*, whence the German name of this Duck, *Knäk-Ente*. It is generally uttered singly, but sometimes repeated twice. The quack is common to both sexes, but in the breeding-season the male utters a harsh grating note resembling *kr-r-r*. The food of the Garganey is the same as that of its congeners, partly insects and other animal food, partly the buds of water-plants and other vegetable substances.

Like most other Ducks, the adult Garganeys pair in mid-winter, but the young not until spring. The first eggs are seldom laid before May. The nest is placed in a variety of positions—hidden under a bush or in thick grass or sedge; far away from water in the forest or among the corn; anywhere and everywhere where a hidden retreat can be found. At Riddagshausen, near Brunswick, I found a nest on the flat mossy margin of one of my friend Nehrkorn's lakes without the slightest cover of any kind; and Lord Walsingham showed me a nest near one of his lakes in South Norfolk in short heath. The nest is made very deep, and is lined with dead grass and leaves, to which is afterwards added plenty of down. The number of eggs varies from eight to twelve, or sometimes fourteen. They are buffish white or cream-colour. They vary in length from 1·9 to 1·7 inch, and in

breadth from 1·4 to 1·3 inch. It is impossible to distinguish eggs of the Garganey from those of the Teal, but, fortunately for the egg-collector, the down of the Garganey cannot easily be mistaken for that of any other British Duck; it is about the size of that of the Teal, not so warm a brown in colour, but its most striking characteristic is the peculiar long white tips, which are much more conspicuous even than those on the down of the Wigeon and Shoveller.

Like the Teal, the Garganey does not sit so long upon its eggs as most Ducks do, incubation only lasting from twenty-one to twenty-two days. As is the case with most Ducks, the male is very attentive to the female until his first moult begins, which is usually before the eggs are hatched. The entire charge of the young falls upon the mother, who is deserted by her mate until he has passed through his second moult and acquired his nuptial plumes late in autumn.

In many respects the Garganey is intermediate in its colours, as it is in size, between the Shoveller and the Teal. The adult male in nuptial dress has the crown and nape black, glossed with green and purple, and margined with a narrow band of white; the chin is black, but the rest of the head and neck is chestnut-brown streaked with white; the breast is pale chestnut broadly banded with black. In the colour of the upper parts, especially in the wings, it closely resembles the Shoveller, except that the broad white band down the upper scapulars is absent. The underparts below the breast closely resemble those of the Pintail, except that the under tail-coverts are white spotted with dark brown, the latter being a feature in which it differs from all the other British species in this genus. Bill black; legs and feet greyish brown; irides hazel. The general colour of the upper parts of the adult female is dark brown, each feather with a pale margin, and the scapulars with a brownish-buff shaft-streak; the margins on the head and wing-coverts are very obscure, except on the tips of the greater wing-coverts, which, with the white tips of the secondaries, form two bars across the wing, but there is no metallic gloss on the feathers between them; the eye-stripe is very indistinct. The general colour of the underparts is white, with ill-defined spots on the lower throat, upper breast, flanks, and under tail-coverts. Young in first plumage closely resemble adult females, but are darker and more suffused with rufous on the breast, and in the males the wing-coverts are slightly suffused with lavender-grey. Males in first nuptial dress are browner on the head, more obscurely barred on the breast, and the elongated scapulars are without the metallic green gloss on the margins. Adult males in moulting-plumage closely resemble adult females, but are darker in colour, and may be distinguished by the alar speculum. Young in down closely resemble those of the Mallard.

ANAS CLYPEATA.

SHOVELLER.

(Plate 63.)

Anas clypeata, *Briss. Orn.* vi. p. 329 (1760); *Linn. Syst. Nat.* i. p. 200 (1766); **et auctorum plurimorum**—*Gmelin, Latham, Temminck, (Hume), (Dresser)*, &c.

Anas mexicana,
Anas rubens,
Anas jamaicensis, } *Gmel. Syst. Nat.* i. p. 519 (1788).

Spatula clypeata (*Briss.*), *Boie, Isis*, 1822, p. 564.
Rhynchaspis clypeata (*Briss.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii: p. 115 (1824).
Spathulea clypeata (*Briss.*), *Flem. Brit. An.* p. 123 (1828).
Clypeata macrorhynchos, *Brehm, Vög. Deutschl.* p. 876 (1831).

The Shoveller is a well-known winter visitor to the British Islands, many remaining behind in spring to breed in suitable localities. It has been obtained in almost all parts of the United Kingdom, including the Orkneys, but not the Shetlands. In England it still breeds sparingly in the counties of Dorset, Kent, Norfolk, Hertford, Cambridge, Huntingdon, Yorkshire, and probably in Northumberland, Durham, and Stafford, whilst in Scotland it breeds in East Lothian, Dumbarton, and Elgin, and probably in several other of the eastern counties. In Ireland the Shoveller is most common in winter in the south, and has been recorded as breeding in Queen's County, co. Dublin, on Lough Derg in Donegal*; and Mr. Lloyd Patterson informs me that it breeds in some numbers at Lough Portmore, near Lough Neagh, in co. Antrim.

The Shoveller is a circumpolar bird, breeding in the Arctic regions of both hemispheres about as far north as lat. 68°. South of lat. 50° it breeds more sparingly, but there are probably few parts of its winter range in which a few do not remain to breed. It winters in South Europe and North Africa as far south as Abyssinia. It is principally known as passing through Turkestan and Mongolia on migration, but a few remain to breed. Its principal winter-quarters on the Asiatic continent are Persia, India, Ceylon, China, and Japan. On the American continent it is rarely found breeding below lat. 50°, and winters in the Southern States, the West Indies, Mexico, and Central America. The Shoveller has four allies—one in the southern portions of South America, one in South Africa, one in Australia, and one in New Zealand, all of which have spotted breasts, and differ in other important respects.

* Since the article on the Red-throated Diver went to press, Mr. Lloyd Patterson has sent me an egg of that bird taken on the 25th of May this year, by Mr. Herdman's keeper, on the banks of a small lake in North-west Donegal, nearly opposite the Island of Arran.

Although the Shoveller has such a wide area of distribution, and is fairly abundant in most localities where it breeds, it is not seen in such large flocks as many other species of Duck. It generally migrates in small parties, and in spring sometimes in single pairs, which occasionally attach themselves to a migratory flock of some other species of Duck. During the breeding-season it mixes freely with other Ducks, both when swimming on the water and feeding on the banks. The Shoveller is a somewhat late migrant, seldom arriving in Germany before the beginning of April. The spring migration lasts throughout May, the birds breeding furthest north passing through at the end of that month. In the valley of the Petchora Harvie-Brown and I saw the Shoveller on the Arctic circle on the 19th of June, and in the valley of the Yenesay I first obtained it in the same latitude on the 18th of June. In Germany in autumn small parties of this bird collect in August, and the greater number of migrants pass through in October; but the first frosts of November are the signal for the final disappearance for the winter of the last stragglers. The Shoveller generally migrates by night in small parties, but the sudden appearance of cold weather will sometimes induce it to begin its journey southwards during the day.

The Shoveller may be regarded as a freshwater Duck, though it prefers lakes near the sea to those which are more inland, and occasionally goes down to the mud-flats to feed at low tide. During the breeding-season it prefers lakes and broad expanses of rivers in wild open country where there are no trees, or where the forests are broken up into straggling patches surrounded by swamps and meadows. If the margin of the lake be hidden by reeds and sedges, and fields of rushes or horsetails stretch far into the shallow water, and especially if here and there streams of running water full of floating pond-weed or other water-plants occur, the locality is one which suits the Shoveller. It is not particularly shy, but can seldom be approached within gunshot, except under cover. The males in their gay plumage are the most difficult to watch; but on the banks of some of Lord Walsingham's lakes near Merton in South Norfolk you may sit behind a hedge, and with a binocular see the Shoveller swimming about amongst Mallards, Pochards, Tufted Ducks, Teal, and Garganey: sometimes they may be seen quietly preening their feathers, at other times sleeping on the surface of the water with their bills hidden under their scapulars, and occasionally feeding at the bottom tail uppermost, the fore half of the body entirely under water. They seldom or never dive, and find some of their food on the water-plants which float in the running streams, some in the mud at the bottom of the shallows, and a considerable part on shore. They feed upon all kinds of small insects and mollusks, occasionally eating tadpoles, frogs' spawn, and very small fish, and varying this diet with the tender shoots of grass and other weeds,

the buds and seeds of water-plants, and even with corn if a field happen to be close to their quarters. They feed off and on during the day; but towards evening they become restless, and often fly to a considerable distance in search of good feeding-grounds. It is not known that the Shoveller differs in any important way from the other Ducks, either in the nature of its food or in the mode of obtaining it; but its large broad bill probably enables it to sift a greater quantity of mud in a given time than its congeners are able to accomplish.

The flight of the Shoveller is not quite so rapid as that of some other Ducks, but the pinions are moved rapidly and very audibly even at some distance. It is not otherwise a very noisy bird. The duck *quacks* not unlike the domestic species; the voice of the drake is a little deeper; if we represent the former as *quaak*, the latter might be represented as *quauk*. On the wing the note is a guttural *puck puck*.

The Shoveller is a somewhat late breeder; eggs are seldom found in this country before the middle of May, and in high latitudes not until the middle of June. During pairing-time the males may constantly be seen chasing the females, and until the female begins to sit she is generally followed by several males every time she leaves her nest; but the Shoveller cannot be regarded as a polyandrous bird like the Cuckoo. Each female appears to have a male especially attached to herself, who waits upon her, and does not venture to rise from the water until she takes wing, but is not allowed to interfere in the selection of a site for the nest, or in the important operation of building it, or, after the eggs are hatched, in the care of the young. The nest is generally placed in the open, well concealed in long grass or heath, and is not very skilfully made. The depression in which it is placed, if deep, is only slenderly lined with dead grass or sedge; but if shallow, a considerable amount of material is collected to give the nest the required depth. When the female leaves her eggs after she has begun to sit, she carefully covers them with down. Seven to nine is the usual number of eggs, but occasionally clutches are found as large as ten to fourteen. Only one brood is reared in the year; but if the first nest be robbed before incubation has proceeded very far, a second nest is made, but seldom more than five or six eggs are laid in it. The eggs are pale buffish white, almost the same colour as those of the Garganey, but with the faintest possible trace of olive. They vary in length from 2·2 to 1·8 inch, and in breadth from 1·6 to 1·4 inch. The down, like that of nearly all Ducks, has pale centres; but, unlike that of the Long-tailed Duck and Mallard, it has very conspicuous white tips, quite as conspicuous as in the down of the Wigeon, more so than in that of the Pintail, but not so much so as in that of the Garganey. The general colour of the down is an almost neutral dark grey, like that of the Teal, Garganey, and Mallard, not nearly so brown as that of the Pintail or Long-tailed Duck. The

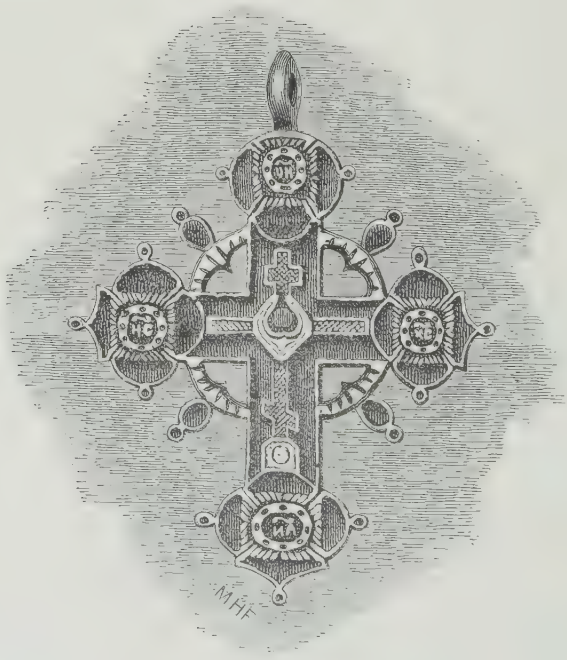
flakes of down are not so large as those of the Mallard and Pintail, but not quite so small as those of the Garganey, Teal, and Long-tailed Duck.

Incubation is said by Naumann to last from twenty-two to twenty-three days. Four weeks after the young are hatched they are able to fly. Whilst they are young the female attends to them very closely, and defends them bravely from danger.

In its winter-quarters in North-west India the Shoveller is described by Hume as a very tame bird, frequenting every little village pond where the natives wash their clothes and drive their cattle to drink. They are almost as tame as domestic Ducks, when closely approached merely waddling into the water and swimming slowly from shore. They seldom rise until fired at, and then often never attempt to leave the pond, but alight again after flying round several times. Being almost omnivorous in its diet, it often frequents the most dirty water, staying as long as any liquid mud or filth remains. They are never seen in large flocks, always in pairs or small parties. They rarely visit deep water by choice, but love to paddle about in the shallows with their broad bill working from side to side sifting the mud in search of food, and with head and neck under water.

The Shoveller is about the size of the Wigeon, being larger than the Garganey, but not nearly so large as the Mallard; it may always be recognized, even in young in first plumage, by its spoon-shaped bill, which is twice as wide near the tip as it is at the base. The principal characteristics of the fully adult male in nuptial dress are as follows:—It agrees with the Mallard in having the head and neck black, with green and purple reflections; across the upper breast is a broad white band, which does not quite meet on the back of the neck, but extends down the scapulars, the longest of which are margined with glossy green, and the middle ones on the outer web with slaty blue, which is the colour of the lesser and median wing-coverts, characters found also in the Garganey. The back is brown, glossed with purple and green on the rump and upper tail-coverts; the alar speculum is metallic green, emphasized by the white tips of the greater wing-coverts; the underparts below the white chest-band are brownish chestnut, shading into white below the vent, and into black glossed with green on the under tail-coverts. Bill slaty black; legs and feet orange-red; irides yellow. The general colour of the upper parts of the adult female is brown, each feather with a broad buff margin, which is nearly obsolete on the rump; the wings resemble those of the adult male, except that the blue on the shoulder is very dull and the speculum is not so glossy. The general colour of the underparts is chestnut-buff, spotted with brown on the breast, flanks, and under tail-coverts. In the female in first plumage there are only traces of blue on the wing-coverts, and scarcely any lustre on the speculum. The male in first plumage scarcely differs from the female in colour, except that the blue on the wing-coverts and the metallic

gloss on the speculum are almost as much developed as in the adult male. The bill of the young birds of both sexes is pale reddish brown, and the legs and feet are flesh-colour. Males in their first nuptial plumage are marked with white on the throat, and have a few dark crescentic bands on the breast, dark bars on the lower belly, and the rich black of the under tail-coverts is mottled with chestnut and white. Adult males in moulting-plumage may be distinguished from adult females by the greater brilliancy of the blue and metallic green on the wing, the plain dark upper tail-coverts, and by the generally darker colour of the entire plumage. Young in down closely resemble those of the Wigeon in having indistinct pale spots on the upper parts, but they possess the dark-brown stripe through the eye so characteristic of most of the species of the genus *Anas*. When first hatched the bill is not widened at the tip, but it grows very rapidly, and before the first feathers are assumed is recognizable as that of a Shoveller.



ANAS BOSCHAS.

MALLARD.

(Plate 63.)

Anas fera, *Briss. Orn.* vi. p. 318 (1760).
Anas boschas, *Linn. Syst. Nat.* i. p. 205 (1766); **et auctorum plurimorum—** *Gmelin, Latham, Wilson, Dresser, Saunders,* &c.
Anas adunca, *Linn. Syst. Nat.* i. p. 206 (1766).
Anas domestica, *Gmel. Syst. Nat.* i. p. 538 (1788).
Anas boscas (*Linn.*), *Forst. Syn. Cat. Brit. B.* p. 35 (1817).

The Mallard is *par excellence* the best known and most widely distributed of the British Ducks during summer. It is generally distributed throughout the British Islands, breeding in all suitable localities, including the Hebrides, the Orkneys, Shetlands, and Ireland. In the breeding-season it is most abundant in the northern portions of our islands, but in the winter it is universally distributed, and then extends its range to the Channel Islands. It frequents inland waters as well as the coast, and in autumn great numbers from northern latitudes swell the ranks of the indigenous birds.

The Mallard is a circumpolar bird, though it is rarely if ever found north of the Arctic circle. It breeds more or less abundantly throughout the Palæarctic and Nearctic Regions; but in Southern Europe, North Africa, and the Southern States of America it is principally known as a winter visitor. Its winter range in Africa extends to the Azores, Madeira, and Canaries in the west, and as far south as Nubia in the east. In Asia it extends to Persia, North India, China, and Japan. Its winter range on the American continent extends southwards to Mexico, the West Indies, and the northern portions of South America. The Mallard has no very near ally.

The formation of language is a process of evolution, and the meaning of words, when it has been definitely settled by custom, must be accepted without a too close inquiry into their derivation. The word horse is masculine and mare is feminine; but when we speak of twenty horses it is not implied that there were no mares among them, the word horse being applied by custom in a special generic sense to include both sexes, but to exclude asses, cows, or any other quadruped. In precisely the same manner the word Mallard is used in a special specific sense to include both the male and female Wild Duck, to the exclusion of Shovellers, Pintails, or any other species of bird. *Mallard* is a French word meaning drake, in contradistinction to *Canard*, which means duk. Possibly the word Mallard

is a corruption of *mâle-canard*; but it has been used for a century to designate the species of Duck which is most common in a domesticated state, and may be applied to both male and female. In precisely the same way when we speak of a Bean-Goose, we mean a definite species of Goose, irrespective of sex. It would be absurdly pedantic to speak of a flock composed of Bean-Geese and Bean-Ganders.

Special interest attaches to the history of the Mallard, because it is the species of Duck which from time immemorial has been domesticated in our farmyards. Nevertheless it is the wildest of all wild Ducks. Possibly the cause of the wildness of the Mallard may also be the reason why it is more capable of domestication than its tamer congeners, namely, its greater intelligence. If the Wild Duck does not possess reasoning powers, but is merely guided by instinct, the only conclusion at which the observant ornithologist can arrive is, that it is impossible to detect any difference in the actions inspired by instinct from those dictated by reason. No birds are more able to take care of themselves than Wild Ducks, and few birds are more sought after, both on account of the excellent sport they give in the field and the delicacy of their flavour on the table. Where they are much shot at they become not only most shy but most sly. The larger the sheet of water on which they happen to be, and the larger the flock which is assembled upon it, the shyer they are. They seem to know perfectly well that they are watched by their enemies, that small ponds are not often visited by sportsmen, and that the sportsman is not likely to be informed of their presence on the larger sheets of water unless they appear in some numbers. They soon learn to distinguish a labourer from a keeper, no doubt from his actions, and not from his appearance. They have excellent memories, as well as the keenest powers of observation. The only way to get a shot is for the sportsman to hide himself; but he must not choose the same spot day after day, the Ducks will soon find out that it is dangerous, and go out of their way to avoid it. If not molested they will breed year after year in the same corner; but if the eggs are taken they will not have forgotten the fact a year hence, but will try another hiding-place. Where the winters are not very severe the Mallard is a resident. These birds have great powers of adaptation to circumstances; they seem to be well aware of the difficulty with which moving water freezes, and when the ice begins to form on their favourite ponds, they delay the process until the last moment by swimming constantly about and keeping the surface always in motion. When the severity of the frost defeats this artifice, they repair to springs and running streams, which they otherwise seldom frequent, as they would be drifted away into danger whilst they slept. Should the frost be so severe that even these become ice-bound, they know perfectly well that the sea does not freeze; they also know the way to the nearest coast, and thither they migrate, until a thaw sets in

and the appearance of the land convinces them that they may return home in safety.

The Mallard is probably the most numerous species of Duck and the most gregarious. Sometimes enormous flocks may be seen in winter on the coasts, flying low over the water, especially about sunset, looking black against the red sky as with rapid flight they hurry to their feeding-grounds. These flocks consist principally of migratory Ducks from the cold north, and Pintail and Wigeon are often found consorting with Mallards. The flight of the latter species is very rapid and powerful, and each stroke of its wings is distinctly audible even at some distance. When disturbed from the water they soon get fairly on the wing and fly straight away, slowly wheeling round if necessary so as to get up wind; but as they rise from the surface the direction of their flight forms a very small angle at first with the plane of the water, and this is also the case as they alight. As they approach the water, they skim with expanded wings, and drop feet first perpendicular into it, with depressed tail and fluttering wings. If a pair of Mallard are on the water the drake generally waits for the duck to get up first. They do not dive in search of food, but they sometimes do so in play, and frequently if wounded in the wing or if pursued by a Hawk. The Mallard, in spite of the wonderful intelligence which it shows in its habits, and in spite of the excellence of its flesh when brought to table, is a great glutton. It may almost be said of this bird that it is omnivorous and never satisfied. No kind of animal life which is to be found in the water comes amiss to it, and few water-plants are safe from its voracity On the banks it eats the juicy ends of grass and the buds of other weeds. In early morning or during the day, after a shower, it repairs to the pastures to feed on the worms and slugs, or strays into the orchards to pick up fallen fruit. In autumn it enters the forest to devour the acorns under the oaks, or wanders over the stubble-fields to pick up the scattered grain. So eager is it to satisfy its appetite, that it can scarcely find an opportunity to roost during the day; and at night most of its time is occupied in sifting the mud on the banks of lakes and streams or on the sea-shore. To carry on this process scarcely any light is required; it may be heard feeding on very dark nights; the selection of the food which remains after the mud has been washed away through the lamellæ with which the edges of its bill are provided must be made entirely by feeling.

The note of the Mallard, which experienced sportsmen say can be distinguished from that of the domesticated Duck, is too well known to need description, but the *quark* of the female is louder if not so harsh as the *quork* of the male. In the pairing-season the difference in the two notes is much greater. The drake swims round and round the duck, answering her feeble *kah* with a harsh suppressed *r-rb*, and when she yields to his attentions uttering a low whistle.

The Mallard is a very early breeder; in spite of his gluttony his sexual instincts are very strong. He rejoins his mate soon after his wedding-dress is assumed, and begins to pay her attentions long before the gloss has begun to fade from his nuptial plumes. Adults are generally repaired, presumably with their old mates, before the new year comes in, sometimes as early as November, but the young do not pair until spring. The flocks of the more southerly breeding birds break up early or late in March, according to the season. In North Germany eggs may be found about the middle of April, in this country from the third week in March onwards, but in Finland not before the beginning of June. The nest is seldom placed close to water. Near Halberstadt I have found it in the midst of a large field of rye at least a mile from water, and in the Dukeries, in Nottinghamshire, it is often in the middle of the forest. In the deer-park near Copenhagen I have seen a Mallard fly from her eggs in an old Crow's nest in an oak tree; and Mr. John H. Wilmore informs me that a Wild Duck laid her eggs in a Rook's nest about four miles from Stockbridge, twenty-five yards from a river, and about thirty feet from the ground. On the bogs near Craig Park in Galway the nests were mostly placed under the shelter of the perpendicular wall of turf which had been cut away for fuel on the east side, so that they were protected from the prevailing westerly gales. The nest is occasionally found in hollow tree-stumps, and sometimes on the tops of pollard willows. When on the ground it is a carelessly constructed mass of dead grass and leaves, deep and carefully concealed amongst long grass or under bushes. The eggs vary in number from eight to twelve, and it is said that as many as sixteen are occasionally found. As soon as the duck begins to sit, she plucks down from her body, which soon accumulates into a mass sufficient to keep the eggs warm when she leaves them to feed. She seldom forsakes the nest at night, and apparently tries to slip off the eggs as quietly as possible, especially before the full clutch is laid; but the drake generally finds her out and not unfrequently has to defend her from the unwelcome attentions of his rivals. The eggs vary in colour from greenish buff to pale buffish green, in length from 2·5 to 2·2 inch, and in breadth from 1·7 to 1·5 inch. Small examples are very liable to be mistaken for eggs of the Pintail and Long-tailed Duck; but the down is much larger than that of the Long-tailed Duck and has very inconspicuous white tips, whilst that of the Pintail has conspicuous white tips; it is almost neutral grey in colour, occasionally with a slight tinge of brown.

Hume says that in India, where in winter it is by far the commonest Duck, the Mallard is very tame, allowing the sportsman to drift down to within forty yards of them in his little boat, as they sit in small parties asleep at the water's edge. Where they are frequently shot at they soon become more wary. The native often catches them by entering the pool

unperceived, with a gourd, basket, or large earthen vessel over his head, cautiously moving up to his neck in water amongst the unsuspicious Ducks and dragging them under the surface one by one without disturbing the rest. In some places the skin of a Pelican is used as a helmet, the ducks being so used to mingle with those birds as to allow such an object to approach them without suspicion or fear. As many as twenty Ducks are sometimes caught on a single trip with such a cunning device.

The Mallard may be distinguished at all ages from other European Ducks by its alar speculum, the predominating colour of which is purple. The fully adult male in nuptial dress agrees with the Shoveller in having the head and neck black with greenish and purple reflections, but the white band between the neck and the upper breast is narrowed to a ring which does not extend to the scapulars nor quite meet on the back of the neck. The back is brown, shading into grey on the wing-coverts, and into almost black on the upper tail-coverts, the longest of which are curled upwards at the tips; the scapulars are more or less vermiculated, and the alar speculum is emphasized by narrow black submargins and broader white margins. The underparts below the white ring are brownish chestnut on the upper breast, shading into greyish white finely vermiculated with dark grey on the belly and flanks; the under tail-coverts are black, faintly glossed with green and purple. Bill olive, black at the tip; legs and feet reddish orange; irides brown. The general colour of the underparts of the adult female is dark brown, each feather having a brownish-buff margin; the wings are similar in colour to those of the male; the underparts are buff streaked with dark brown except on the chin and upper throat. Young in first plumage closely resemble adult females, but the males are somewhat darker in colour. Males in their first nuptial dress are much duller in colour than adults.

Adult males in moulting-plumage resemble adult females, but are somewhat darker in colour. Young in down have the upper parts dark brown, with nearly white spots on the wings, scapulars, and sides of the rump. The underparts are pale brown, palest on the belly, and shading into buff on the throat. They have a buff stripe over the eye, a dark brown stripe through the eye, and a dark spot on the end of the ear-coverts.

The Summer Duck, *Anas sponsa*, a common North-American species, has been included in the British list; but as it is frequently kept on ornamental waters, there is no reason to suppose that it has ever occurred on our islands in a wild state.

The Bimaculated Duck, *Anas bimaculata*, is also included by some writers as a British bird, but is now generally admitted to be a hybrid between the Mallard and the Teal.

Genus FULIGULA.

Bechstein, probably prompted by the elder Naumann, and following in the wake of Willughby and Ray, whose attention was first called to the subject by Mr. Ralph Johnson, appears to have been the first ornithologist to divide the Ducks into two genera, to which he assigned characters in 1803. In the second part of his 'Ornithologisches Taschenbuch von und für Deutschland,' on page 405, he points out the difference between the two groups, and promises to recognize them as genera in a second edition if the public approves of his doing so. I have not been able to find any subsequent edition of his works where names are given to these two groups; but they have been recognized by many ornithologists as sub-families under the names of Anatinæ and Fuligulinæ, terms which were probably first applied to them by Swainson in 1831. It seems to me that the second of these groups forms a convenient genus; but driven by the modern craze for genus-making, the twenty-six species which it contains have been distributed amongst no fewer than sixteen genera!

1. Branta.
3. Aythya,
2. Melanetta, } *Boie*, 1822.
2. Oidemia,
3. Clangula,
2. Nyroca, } *Fleming*, 1822.
1. Harelda,
2. Fuligula, } *Stephens*, 1824.
1. Micropterus,
1. Histrionicus, } *Lesson*, 1828.
1. Pelionetta, *Kaup*, 1829.
3. Fulix, *Sundevall*, 1835.
1. Camptolaimus, *Gray*, 1841.
1. Hymenolaimus, *Gray*, 1843.
1. Metopiana, *Bonaparte*, 1856.
1. Aristonetta, *Baird*, 1858.

—

26 species.

I think most readers will agree with me that the wisest course is to consign the whole list to the waste-paper basket, and adopt the name *Fuligula* as the best generic term. The Tufted Duck, *Fuligula cristata* (being the *Anas fuligula* of Linnæus), must be accepted as the type.

The Diving Ducks differ from the Sheldrakes and the other non-Diving Ducks, and agree with the Eiders, the Mergansers, and the Spine-tailed Ducks, in having the hind toe furnished with a well-developed lobe. They are very closely allied to the Eiders, Steller's Duck forming an intermediate link between them; but as it has the patches of emerald-green on the head so characteristic of the Eiders, it may be most conveniently classed with them.

There are about five-and-twenty species belonging to this genus. In the tropics they are only known in winter or on migration. Twenty-one species breed in the Nearctic and Neotropical Regions, of which nine are peculiar to the former, seven to the latter, and five common to both. Of the remaining species, which breed in the temperate regions of the southern hemisphere, two inhabit the south of South America, one South Africa, and three New Zealand.

The Diving Ducks fly, swim, and dive to perfection, but walk clumsily; they have been called the Sea-Ducks, but most of them retire inland to breed, and some remain on freshwater lakes throughout the year. They generally breed on the ground, but some species prefer to make their nests in hollow trees.

So far as is known, the changes of plumage of the Diving Ducks very closely resemble those of the Mallard and its allies.

The following key will enable the student to distinguish any male British Duck in nuptial plumage belonging to this genus; but it may assist him to be informed that the first five species have white, and the last seven brown axillaries :—

Entire bill vermilion	Red-crested Pochard .	Head and upper neck chestnut.
	White-eyed Pochard ..	
Lower back and scapulars white, vermiculated with black	Pochard	
	Scaup	Crown and neck metallic green and purple, in strong contrast to lower breast.
	Tufted Duck	
A large white patch extending from each eye round the nape	Buffel-headed Duck ..	
	Golden-eye	
Scapulary region marked longitudinally with white.	Harlequin Duck	Metallic alar speculum.
	Long-tailed Duck.	
	Velvet Scoter.	
Wings and scapulars entirely black	Common Scoter.	
	Surf-Scoter	Large white patch on the crown, surrounded with black.

The females may be distinguished as follows :—

A. Axillaries white.

RED-CRESTED POCHARD.

More or less white vermiculations on back and scapulars ..... { POCHARD. / SCAUP ..... } White alar speculum.

Head and neck dull chestnut, and under tail-coverts white ..... { WHITE-EYED POCHARD .. / TUFTED DUCK ..... } White alar speculum.

B. Axillaries brown.

A white patch on the ear-coverts ..... { BUFFEL-HEADED DUCK .. / GOLDEN-EYE ..... } White alar speculum.

Dark brown under tail-coverts. { VELVET SCOTER ..... / SCOTER ..... / SURF-SCOTER ..... } Bare part of culmen $1\frac{1}{2}$ in. or more. / Frontal feathers extending nearly an inch beyond feathers at side of bill. / HARLEQUIN.

LONG-TAILED DUCK.

FULIGULA RUFINA.

RED-CRESTED POCHARD.

(Plate 64.)

Anas fistularis cristata, *Briss. Orn.* vi. p. 398 (1760).
Anas rufina, *Pall. Itin.* ii. App. p. 713 (1773); **et auctorum plurimorum**—*Gmelin, Latham, Temminck,* (*Dresser*), (*Saunders*), &c.
Branta rufina (*Pall.*), *Boie, Isis,* 1822, p. 564.
Fuligula rufina (*Pall.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 188 (1824).
Netta rufina (*Pall.*), *Kaup, Natürl. Syst.* p. 102 (1829).
Callichen ruficeps, *Brehm, Vög. Deutschl.* p. 922 (1831).
Mergoides rufina (*Pall.*), *Eyton, Rar. Brit. B.* p. 57 (1836).
Aythya rufina (*Pall.*), *Macgill. Man. Brit. B.* p. 191 (1842).

The first record of the Red-crested Pochard in the British Islands is to be found in Hunt's 'British Ornithology' (ii. p. 333), wherein a female bird is figured which was killed on Breydon Broad in Norfolk in July 1818. Since that date about a score examples have been obtained, and perhaps as many more observed, eighteen having been seen in one instance on the Thames near Erith. One has been obtained in Scotland, one in Wales, and one, so recently as 1881, in Ireland, as recorded by Sir Ralph Payne-Gallwey. The greater number have been obtained in the district lying between the Humber and the Thames, but examples have occurred in Devonshire and Cornwall. Most of the birds have been captured in winter, and are probably visitors from Germany, driven from that country by severe weather.

The Red-crested Pochard has a very limited range, confined to the south-west portion of the Palæarctic Region. North of about lat. 50° it is an accidental visitor to Pomerania and the Baltic Provinces, Poland, Denmark, Belgium, and the north of France. Its principal habitat is in Spain, the basins of the Mediterranean, Black, and Caspian Seas, and Russian Turkestan. In South Europe and Algeria it is a resident, but to the Mediterranean east of Sicily it is an extremely rare winter visitor. It is only a summer visitor to Turkestan, migrating southwards to Afghanistan to winter throughout India. It has no very near ally.

The Red-crested Pochard does not differ much in its habits from the Common Pochard. It may be regarded as almost exclusively a freshwater species. It loves to frequent the deep still lakes and broads, especially

those where the bottom is covered with water-weeds and the banks are clothed with tall rushes and other aquatic vegetation. It also haunts more sparingly broad rivers where they widen out and flow slowly, and submerged weeds grow near the margin. On migration it often rests at very small pools and insignificant streamlets, probably to pick up food and to rest. Although Dresser states that the Red-crested Pochard does not dive, but obtains its food like the Mallard, it is a remarkably expert diver, and feeds principally in deep water. Where it is much molested, it soon becomes very shy. Like most diving Ducks, it does not come much on the land, and when it does visit the shore to graze on the short grass or pick up small shells and insects it rarely wanders far from the water, in which it is so thoroughly at home. It is, however, said to walk better than the other Pochards. Its flight is strong but heavy, and it rises in a slow laboured manner. When in the air its wings make a very distinct rushing sound, so peculiar in tone that even a solitary bird can be recognized by this alone by experienced sportsmen as it flies over in the dark. The call-note of the Red-crested Pochard resembles that of the Pochard, and is described by Hume as a deep grating *kurr*; he also states that the males occasionally utter a sharp sibilant note, reminding one of the whistle of the Wigeon, although quite different. Naumann says that the note is not unlike the croak of a Crow.

In suitable districts the Red-crested Pochard feeds during the day; but it also obtains much of its food at night, the birds that frequent water where food is not abundant moving off at dusk to localities more suitable. It moves about little in the daytime, making its journeys from place to place in the night or at dusk. Its food is principally vegetable, but it feeds more on animal substances than the Pochard. It eats the leaves, stems, roots, and seeds of grasses and aquatic vegetation, also small frogs, and occasionally fish, shells, land and freshwater insects, grubs, and worms. Hume states that in India it feeds from about eight to ten A.M., and sleeps from ten A.M. to three P.M., floating well out in the middle of the stream or lake. Sometimes they may be seen playing with each other or washing and diving during the heat of the day.

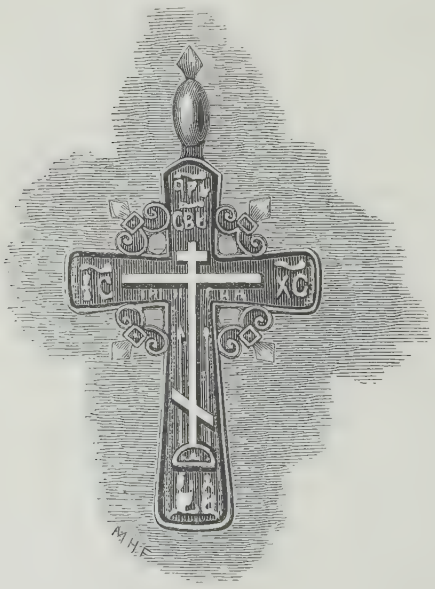
The breeding-season of the Red-crested Pochard varies somewhat according to locality. In Algeria Tristram and Salvin found eggs in June, but in Central Germany Dr. Baldamus found complete sittings of its eggs by the middle of May. It makes its nest close to the water. Tristram describes it as like that of the Coot, but not so large and better concealed. Dr. Baldamus, who found this species breeding several seasons in succession in a pond near the Mansfelder salt-lake in Germany, states that it arrived for nesting-duties late in March or early in April, but it did not begin to build until the end of the latter month. The pond was overgrown with reeds, flags, and other aquatic plants. Between the years 1866–70 he

found ten nests, which were taken between the 12th of May and the 1st of July, but the eggs taken on the latter date were highly incubated. The late clutches are caused by the first eggs that are laid being taken, so that the birds have to lay again. The nests were always built amongst the rushes and flags on a small island in the pond. The foundation was made of decayed stems of rushes or dead leaves, on which a warm bed of down was placed as the full complement of the eggs was completed. When the female leaves the nest she carefully covers her eggs. Tristram says that in Algeria the male appeared to desert the female as soon as she began to sit. The eggs of the Red-crested Pochard are usually eight or nine in number, and resemble those of the Pochard, but are paler and greener. They vary in length from 2·35 to 2·2 inch, and in breadth from 1·7 to 1·58 inch. They almost resemble in colour pale eggs of the Golden-eye; but there can be no doubt that the down is dark and quite unlike that of the hole-building species.

Hume says that the Red-crested Pochard arrives on the plains of Upper India at the end of October, but it is the middle of November before the great bulk of the birds appear. It leaves the southern portion of its winter range in India about the third week in March, and further north about the first week in April. In winter Red-crested Pochards gather into moderate-sized flocks, but on very large sheets of water they often congregate in thousands. Males and females live together, but sometimes flocks are met with composed entirely of males. They afford excellent sport, but their flesh is often rank and unpalatable.

The Red-crested Pochard is about as large as a Pintail. The adult male in nuptial dress has the entire head and the fore upper neck buffish chestnut, somewhat paler on the elongated feathers of the crown and nape; the hind upper neck, the lower neck, upper mantle, breast, belly, under tail-coverts, rump, and upper tail-coverts are dull black, faintly glossed with purple on the belly, and more distinctly so with green on the other parts; the flanks, axillaries, under wing-coverts, shoulders, primaries, and secondaries (except the outer web of the three first primaries and the tips of all of them, which are dark grey) are pinkish white; and traces of white vermiculations appear on many of the feathers of the mantle. The back, scapulars, wing-coverts, and innermost secondaries are slaty grey, suffused with pink on the scapulars, which are somewhat filamented. Bill brilliant crimson, brown on the nail; legs and feet reddish orange, blackish on the webs; irides red. The general colour of the upper parts of the adult female is greyish brown, suffused with yellowish brown on the head, darkest on the rump and palest on the margins of the scapulars, except the longest; the white shoulder-patches of the male are absent, and the white on the primaries and secondaries is suffused with grey instead of pink. The whole of the underparts are

white, every feather having an obscure grey centre except the axillaries, some of the under wing-coverts, and the longest under tail-coverts. Young in first plumage closely resemble adult females, but the darker centres of the feathers of the underparts are pale brown instead of grey. In this plumage males may be distinguished from females by having the back and breast a somewhat darker brown, and by having more indications of a crest. Males in first nuptial dress have the black of the underparts more suffused with brown, the white on the wings is not suffused with pink, and the colour of the bill is much paler. Males in moulting-plumage very closely resemble adult females, but may be distinguished by the brighter colour of their bills and eyelids, by the greater development of their crests, by the darker brown of the belly and under tail-coverts, and by the redder colour of the feet. Young in down are described (Baldamus, Journ. Orn. 1870, p. 280) as having the upper parts dull olive-grey, with a buff spot on each shoulder, and the underparts buff; a buff stripe passes over each eye, and through the eye a dark stripe passes, which divides into two behind the eye. From this description it appears that the markings on the head resemble those of the Pintail; but the buff underparts and the absence of four of the six pale spots on the back are sufficient marks of distinction.



FULIGULA NYROCA.

WHITE-EYED POCHARD.

(Plate 64.)

Anas nyroca, *Güld. Nov. Comm. Petrop.* xiv. p. 403 (1769); **et auctorum plurimorum**—*Latham*, (*Boie*), *Naumann*, (*Jenyns*), (*Selby*), (*Stephens*), (*Macgillivray*), (*Blyth*), (*Jerdon*), (*Hume*), (*Scully*), (*Oates*), (*Salvadori*), (*Degland & Gerbe*), (*David & Oustalet*), &c.

Anas africana, Anas ferruginea, } *Gmel. Syst. Nat.* i. pp. 522, 528 (1788).

Anas leucophthalmus, *Bechst. Orn. Taschenb.* i. p. 450 (1802).

Aythya nyroca (*Güld.*), *Boie, Isis*, 1822, p. 564.

Marila nyroca (*Güld.*), *Flem. Phil. Zool.* ii. p. 260 (1822).

Fuligula nyroca (*Güld.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 201, pl. 55 (1824).

Nyroca leucophthalmos (*Bechst.*), *Flem. Brit. An.* p. 121 (1828).

Aythya leucophthalmos (*Bechst.*), *Brehm, Vög. Deutschl.* p. 917 (1831).

Nyroca ferruginea (*Gmel.*), *Sharpe & Dresser, B. Eur.* vi. p. 581 (1872).

The White-eyed Pochard, or Ferruginous Duck, as it is sometimes called, is a somewhat rare straggler on migration to the British Islands, occurring most frequently in the eastern counties of England. Gray only mentions one instance of its occurrence in Scotland, but Jardine says that he obtained an example in the Edinburgh market. Although the species was unknown to Thompson as an Irish bird, two examples are recorded as having been obtained in Ireland in 1871 (Blake-Knox, 'Zoologist,' 1871, p. 2645), and Sir Ralph Payne-Gallwey records two that he shot on the east coast in 1879.

The geographical distribution of the White-eyed Pochard is either a very remarkable one, or we have much yet to learn respecting it. In Europe it is not known to breed north of the Baltic, and only occurs accidentally in Denmark and the Baltic Provinces. In Russia the northern limit of its range appears to be Moscow, Kazan, and Ekaterinburg; but in the valley of the Obb Finsch says that he undoubtedly saw it as far north as the Arctic circle. No other traveller has recorded it from Siberia, nor did Prjevalsky meet with it in Mongolia; but since L'Abbé David records its abundance in winter in North China, and Blakiston and Pryer have sent examples from Japan, there can be no doubt that it must breed either in the valley of the Amoor or in Mongolia. It is a summer visitor to Central Europe south of the Baltic, but is a resident in the basin of the Mediterranean, though it has not been found breeding in Egypt. It is an accidental visitor on migration to the Canaries, a resident in the basins of the Black and

Caspian Seas, and breeds throughout Turkestan and in Cashmere (where it is for the most part a resident), migrating through Afghanistan (where a few remain to breed) to winter in India and North Burma. It has no ally with which it is likely to be confused.

By far the best account of the life-history of the White-eyed Pochard is to be found in Hume and Marshall's 'Game Birds of India,' a work which abounds in careful field-notes on the winter habits of so many of our British birds. The White-eyed Pochard loves to frequent weedy lakes and broads, where the water is moderately deep and where there is plenty of cover. It is also sometimes found on slow-running rivers, and even small ponds and marshes, where the banks are clothed with tangled vegetation. Few Ducks are more shy and retiring. It is seldom seen in the open water, being excessively fond of cover, skulking amongst the reeds and rushes, and only rising when absolutely compelled. It is so fond of hiding amongst the aquatic vegetation that not even the incessant firing of the sportsmen will drive it from its safe retreat. It is occasionally seen in flocks, but more often in pairs, and is repeatedly flushed singly. When disturbed it rises with some difficulty, and always by preference against the wind. When flushed from the water it rises in a clumsy way, striking the surface with its feet; but when disturbed from the reeds it flies off like a Partridge with a slow straight flight, and often drops suddenly after going a short distance. Its flight is moderately swift. It walks rather clumsily on the land, and seldom goes far from the water's edge, running in a very shuffling manner. It swims with great rapidity, and dives with marvellous agility.

The White-eyed Pochard is almost omnivorous in its diet. It feeds on leaves, stems, roots, and seeds of aquatic plants, on small freshwater shells, and on insects, worms, grubs, and small fishes. Sometimes it may be seen swimming about nibbling at the herbage, or picking the small shells and insects from the leaves of the water-plants; but it is continually diving and bringing up bunches of slimy weed, which it eats on the surface. Sometimes it remains under water for nearly two minutes, but generally only stays down from forty to fifty seconds. It feeds by preference during the day; but when it frequents open water it retires at dusk to its feeding-grounds, sleeping in the daytime. Hume describes the note of the White-eyed Pochard as something like that of the Pochard, a harsh *kirr, kere, kirr*.

The breeding-season of the White-eyed Pochard is in June in Cashmere; and so abundantly does it nest there, that boatloads of its eggs are gathered and sold. In Algeria it breeds in June and July; but Irby says that in Southern Spain it begins to breed about the end of April, and in the valley of the Danube it lays from the middle of May onwards. Incubation lasts thirty days. The nest is generally placed amongst aquatic vegetation, sometimes on the banks, and sometimes floating in the stagnant water, supported by masses of fallen plants. At other times it is placed on a

tussock of sedge; and Taczanowski found it in Poland built in a bush two or three feet above the ground, but carefully concealed. The nest is of moderate size, made of dry rush and sedge, the finer kinds used to form the interior, together with down and a few feathers.

The White-eyed Pochard generally lays ten eggs, but the clutches vary from nine to fourteen. The colour of the eggs is a pale creamy brown, like that of coffee with plenty of milk in it, and occasionally there is an almost imperceptible shade of green. They vary in length from 2·2 to 1·9 inch, and in breadth from 1·54 to 1·4 inch. The only eggs with which they are likely to be confused are those of the Gadwall, the Wigeon, the Harlequin, and the Smew; but the down of the three latter species is very different, that of the White-eyed Pochard being very dark brown and having no perceptible white tips. Its eggs may generally be distinguished by the relatively greater weight of the shell. Eggs selected as near as possible of the same dimensions (two inches by an inch and a half) weigh respectively, of the White-eyed Pochard 63 grains, Smew 55 grains, Gadwall 50 grains, and Wigeon 45 grains.

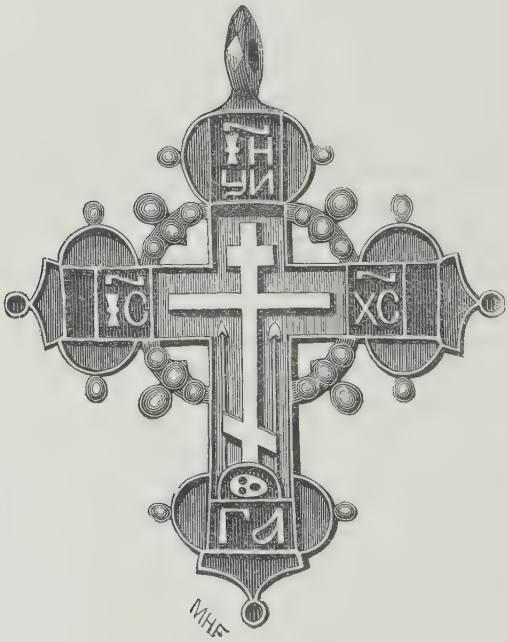
When the nest is approached, the female slips quietly off into the water, and tries to avoid observation by diving, in a very similar way to a Grebe.

Captain Shelley states that in Egypt, where this Duck is very common, he has seen them in immense flocks, many thousand birds together, keeping in the centre of the lake. When disturbed, the noise made by their rapidly moving feet striking the water, together with that caused by their wings, could be distinctly heard at a distance of two miles. In India the flesh of the White-eyed Pochard is very inferior; but in Spain, Irby states that it is excellent, and far superior to that of the other two Pochards. This may probably be owing to a difference in the food of the birds inhabiting the two countries.

The White-eyed Pochard is about the size of the Wigeon. The adult male in nuptial dress has the head, neck, and breast reddish chestnut, shading into brownish chestnut on the flanks, and into dark greenish brown on the rest of the upper parts except the quills, where it only extends to the outer webs of the first four primaries and to the tips of both primaries and secondaries, the rest being pure white, as are also the belly, axillaries, under wing-coverts, and under tail-coverts; the dark colour of the mantle extends round the neck, forming an obscure ring; the mantle and upper scapulars are sprinkled with minute buff specks, as in the Tufted Duck. On the chin is a small but very conspicuous white spot. Bill black; legs and feet slate-grey, darker on the webs; irides white.

The female White-eyed Pochard resembles the male more closely than is the case with most Ducks. It only differs in having the chestnut on the head browner, and that upon the breast suffused with white and less clearly defined

from the white on the belly, which is suffused with brown. The feathers of the mantle and scapulars have buffish-brown pale margins, which is also the case with the flank-feathers. In young in first plumage the brown predominates still more, and the white and the chestnut are much less conspicuous. Females may be distinguished from males by the absence of the white chin-spot. Males in first nuptial dress have the chestnut on the breast slightly obscured with very narrow white margins to the feathers. Males in moulting-plumage closely resemble males in first plumage, but are somewhat brighter in colour, especially on the head, neck, and breast. The under tail-coverts and the chin-spot are also a much purer white. Young in down are dark brown on the upper parts, with pale spots on the wings and scapulars; the underparts are buff, shading into brown on the flanks.



FULIGULA FERINA.

POCHARD.

(Plate 64.)

Anas penelope, *Briss. Orn.* vi. p. 384 (1760).
Anas ferina, *Linn. Syst. Nat.* i. p. 203 (1766); **et auctorum plurimorum**—*Gmelin, Latham, Temminck,* (*Selby*), (*Bonaparte*), (*Dresser*), (*Saunders*), &c.
Anas lurida, Anas erytrocephala, *S. G. Gmel. Reise Russl.* i. pp. 70, 71 (1770).
Anas rufa, *Gmel. Syst. Nat.* ii. p. 515 (1788).
Nyroca ferina (*Linn.*), *Flem. Phil. Zool.* ii. p. 260 (1822).
Aythya ferina (*Linn.*), *Boie, Isis*, 1822, p. 564.
Fuligula ferina (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 193 (1824).
Platypus ferinus (*Linn.*), *Brehm, Lehrb. Naturg. eur. Vög.* ii. p. 828 (1824).
Aythya erythrocephala (*Gmel.*), *Brehm, Vög. Deutschl.* p. 919 (1831).
Fuligula homeyeri, *Baedeker, Naumannia*, 1852, Heft i. p. 12, pl. i.
Fulix ferina (*Linn.*), *Salvad. Faun. Ital. Ucc.* p. 265 (1872).

The Pochard is best known in the British Islands as a winter visitor, but many remain behind in spring to breed. It is one of the most abundant species of Ducks on the coasts of Scotland, including the Orkneys, Shetlands, and the Hebrides, and there can be little doubt that it breeds in that country. In England it is equally well known, and its nest has been taken in many localities. It breeds regularly in Norfolk and in Dorsetshire, in the East Riding of Yorkshire at Hornsea Mere, and in some of the Midland counties. In Ireland it has been known to breed in the counties of Sligo, Antrim, and Tipperary.

The geographical distribution of the Pochard presents some difficulties which future researches may possibly remove. Its known breeding-range appears to be confined to the western half of the Palæarctic Region. In Russia it breeds as far north as Lake Ladoga and as far south as the Caucasus. This wide range apparently contracts both to the east and to the west until its boundaries meet in West Europe in England and in West Siberia at Lake Baikal. To the rest of West Europe and to North Africa it is a winter visitor, though it is said that a few formerly bred in Spain and Algeria. It is principally known on passage in Turkestan, but some remain to winter in the south of that country. Its winter range in Asia is very extensive, reaching from Asia Minor through Persia, Afghanistan, India, China, and occasionally to Japan. It has not been met with in the valley of the Amoor, but Prjevalsky observed it on migration in South-eastern Mongolia. On the American continent the Pochard is represented

by a very nearly allied species, the Red-headed Duck, *Fuligula americana*. Some ornithologists have regarded this species as doubtfully distinct from our bird; but it may be recognized by the absence of the black at the base of the bill*, the greyer colour of the back, the unvermiculated white belly, and by the presence of a reddish-purple gloss on the chestnut neck.

From the Duck point of view England must appear to be a desert inhabited by monsters who constantly wage war upon the rightful possessors of the soil, plunder their homes, drain their feeding-grounds, mow down their reed-forests, and otherwise make the struggle for existence insupportable. Most of the Ducks which formerly bred in this country have been exterminated, or have emigrated to more congenial countries; but a few oases still remain here and there where the game-keepers have strict orders to protect them, and the only enemies they have to fear are a stray fox, a voracious pike, or the rare visits of a privileged ornithologist. One of these favoured localities is situated in the north-west of Hertfordshire, not much more than thirty miles from London. The Tring reservoirs are large sheets of water, the oldest of which was formed about a century ago to accumulate water for the supply of the canal, and they have become extensive breeding-places for several species of Duck, under the protection of Sir Nathaniel (now Lord) de Rothschild. They are surrounded on most sides by large reed-beds, varied by patches of bulrushes, flags, and sedge, which provide excellent cover, where numbers of Coots, Waterhens, Great Crested Grebes, and Little Grebes make their nests. When I visited them on the 27th of last June, I saw great numbers of Mallard and a few Teal and Shovellers, whilst a pair of Black Terns were busily feeding. As the latter birds showed no anxiety at our invasion of their grounds, it is probable they may not have been breeding. On most of the reservoirs flocks of drake Pochards were feeding in the company of Coots and Great-crested Grebes, and many duck Pochards left the reeds at the approach of the punt. We found a Pochard's nest containing twelve eggs in a bed of flags. The nest was entirely concealed by the flags, and was about twelve feet from the open water. It closely resembled the nests of the Coot, and may possibly have been built upon an old nest of that bird. It was made of old dead flags, and was supported by the roots of the surrounding flags, which were growing in water three or four feet deep. The eggs were entirely concealed by dead stalks and down. The Pochards are joined in winter by numerous Golden-eye and Tufted Duck, but the latter species disappear before May.

All the seven species of freshwater Ducks which remain in England during the summer may be seen breeding on the estate of Lord Walsing-

* In Dresser's figure of the Pochard in the 'Birds of Europe' the black at the base of the bill is omitted; but a reference to his description, which is not very clear, leads to the conclusion that an error has been committed by the colourist.

ham at Merton in the south of the county of Norfolk. These species are the Mallard, Shoveller, Pochard, Gadwall, Garganey, Teal, and Tufted Duck. In this part of Norfolk there is some very fine farming-land and many woods containing grand old trees; but this rich country is varied with large tracts of rough stony ground, sprinkled over with heather and gorse in the higher parts, and running down to swamps and bogs in the low-lying districts, which are given over to rank vegetation of various kinds—reeds, rushes, sedges, flags, &c. Here and there are natural lakes or meres, from the size of a pond up to a hundred acres, and in some places artificial pieces of water have been made by damming up the streams. The soil is poor and sandy and has never been cultivated; but plantations have been made at intervals, and alders, willows, and brambles have been allowed to run riot in the hollows. It is difficult to imagine a more charming country, the paradise of the ornithologist, though possibly the despair of the farmer. Fortunately this property is in the hands of a naturalist, and the Ducks and other birds breeding on the edges of the meres are carefully preserved. On the 14th of May last year Lord Walsingham took me to visit several of these sheets of water and showed me seven species of Ducks in a perfectly wild state. Near Thompson Mere are several very small ponds: on a tall tussock of sedge a Pochard was sitting on ten eggs near the margin of one of these little ponds, and on the edge of another the gamekeeper showed us the nest of a Waterhen containing five eggs, the nest of a Pochard with ten eggs, and that of a Tufted Duck with six of its own eggs and one of a Pochard. Each of these nests was built on a tussock of sedge, and was entirely concealed by the leaves and flowering stalks of the *Carex* which formed it. The nest of the Pochard is merely a hollow lined with dead grass and sedge and, after the bird has begun to sit, with down. Ten is the usual number of eggs; but seven or eight are often found, and sometimes as many as thirteen. They vary in length from 2·45 to 2·2 inch, and in breadth from 1·75 to 1·65 inch. They scarcely differ in colour from eggs of the Scaup, Tufted Duck, and Pheasant. Small eggs of the Pochard are indistinguishable from large eggs of the Tufted Duck. The down is almost the same size and colour as that of the Mallard, greyish brown, without white tips, but with obscure white centres; it is not nearly so black as that of the Tufted Duck.

The Pochard resembles the Tufted Duck very closely in its habits. It is quite as accomplished a diver, and seeks its food in the same manner by tearing up branches of weeds from the bottom of the lakes which it frequents. Naumann says that it is more exclusively a vegetable feeder than some of its allies, though it does not refuse insects or small shell-fish if they come in its way. This may probably account for its great partiality for fresh water, even in winter, though it is often seen on the coast, and also for the fact that it is much better eating than its allies. Its flight is rapid,

though its wings are somewhat small for the size of the bird; but they are moved with great rapidity and considerable noise. The alarm-note of the Pochard is a harsh *kr, kr, kr,* very similar to that of the Tufted Duck, but its call-note is a low whistle.

The adult male Pochard in nuptial dress has a rich chestnut head and upper neck; a small white spot on the chin; a glossy back, upper mantle, lower neck, and breast; dull black rump, upper tail-coverts, and under tail-coverts; and white axillaries and under wing-coverts. The mantle, scapulars, wing-coverts, belly, and flanks are lavender-white, finely vermiculated with black. The quills are pale slate-grey and the tail-feathers are dusky slate-grey. Bill black to a little beyond the nostrils and at the tip, intermediate space slate-grey; legs and feet slate-grey, nearly black on the webs; irides orange-yellow.

The adult female closely resembles the adult male in the general distribution of its colours; but the chestnut and black on the head, neck, upper breast, and upper mantle is replaced by buffish brown, shading into nearly white on the throat. The vermiculations on the back and scapulars are browner and less distinct, and absent altogether from the wing-coverts; the black on the rump and upper and under tail-coverts is replaced by brown; the general colour of the breast and belly is browner and the vermiculations are confined to the flanks.

Young in first plumage closely resemble adult females; but the feathers of the back and scapulars are brown with pale edges, and the vermiculations are absent from the flanks. Young males may be distinguished from females by the redder brown of the head and neck and by having the feathers of the upper back and the scapulars indistinctly powdered with white. Males in first nuptial plumage differ from adults in having the chestnut of the head and neck slightly paler and the black of the breast and upper back replaced by dark brown. Males in moulting-plumage are intermediate in colour between adult females and males in first nuptial dress. Young in down are described by Naumann as dark brown on the upper parts, shading into rusty brown on the head, and into yellowish white on the vent.

FULIGULA MARILA.

SCAUP.

(Plate 64.)

Anas glaucium minus striatum, *Briss. Orn.* vi. p. 416 (1760).
Anas marila, *Linn. Syst. Nat.* i. p. 196 (1766); **et auctorum plurimorum**—*Gmelin, Latham, Temminck,* (*Bonaparte*), (*Selby*), (*Dresser*), &c.
Anas subterranea, *Scop. Ann. I. Hist. Nat.* p. 67 (1769).
Anas fraenata, *Sparrm. Mus. Carls.* ii. pl. 38 (1787).
Aythya marila (*Linn.*), *Boie, Isis,* 1822, p. 564.
Fuligula marila (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 198 (1824).
Platypus marilus (*Linn.*), *Brehm, Lehrb. Naturg. eur. Vög.* ii. p. 830 (1824).
Nyroca marila (*Linn.*), *Flem. Brit. An.* p. 122 (1828).
Aythya islandica, *Brehm, Vög. Deutschl.* p. 911 (1831).
Fuligula gesneri, *Eyton, Cat. Brit. B.* p. 58 (1836).
Fuligula affinis, *Eyton, Mon. Anat.* p. 157 (1838).
Fuligula mariloides, *Vigors, Zool.* '*Blossom*,' p. 31 (1839).
Fuligula minor, *Bell, Proc. Ac. Nat. Sci. Phil.* i. p. 141 (1842).
Marila frenata (*Sparrm.*), *Bonap. Compt. Rend.* xliii. p. 651 (1856).
Fulix marila (*Linn.*), Fulix affinis (*Eyton*), *Baird, B. N. Amer.* p. 791 (1858).

The Scaup is a regular and common winter visitor to the British Islands, where it is widely distributed on most parts of the coast. It is a Sea-Duck, and rarely goes far inland, although it loves muddy estuaries and the mouths of tidal rivers. It is less abundant on the west coast of Scotland, probably because the shores are too rocky. In Ireland it frequents almost every part of the coast, but is rare in the south and seldom met with inland. Scaups have been observed throughout the summer in our islands (especially in the Shetlands), but there is no instance on record of its having nested in this country.

The Scaup is a circumpolar bird, breeding throughout the Arctic regions as far north as lat. 70°, and in a similar climate above the limits of forest-growth on the mountains of Southern Scandinavia. It is only a summer visitor to Iceland, but is a resident in the Faroes, wintering on the southern coasts of the Baltic and on the shores of the German Ocean. It winters sparingly in Spain and in the basin of the Mediterranean, but it is commoner in the Black Sea and on the southern shores of the Caspian. In North-east Africa it winters as far south as Abyssinia. It is not known to pass through Turkestan on migration, but a few winter in Persia and North-west India. It has not been recorded from the Amoor, but it winters on Lake Baikal, and in Japan, China, and Formosa. On the American continent

it is not known to breed south of the Hudson's Bay Territory, but is found in winter on the great lakes in the interior, on many of the rivers, and on both the Atlantic and Pacific coasts of the United States, Mexico, and Central America. Small examples from the American continent (measuring in length of wing $\frac{3}{4}$ inch less than small European examples, and $1\frac{1}{2}$ inch less than large European examples) have been described as distinct under the name of *Fuligula affinis*; but as the two supposed forms intergrade in size, and are not known to differ on the American continent in their geographical distribution, it seems premature to regard them as subspecifically distinct.

Although the Scaup is a Sea-Duck, it is by no means exclusively so; even in winter it is occasionally seen on fresh water, and in summer it retires some distance inland to breed. We found it not uncommon on the lakes on the tundra near the limit of forest-growth, both in the valley of the Petchora and in that of the Yenesay. Like most other Ducks, except perhaps the Long-tailed Duck, they were very shy, and we seldom obtained a good view of them, unless we could find a side of the lake where a few birches and willows made sufficient cover to hide our approach: then sometimes we got charming peeps of groups of Ducks of various species, floating half asleep under the southern sun, or lazily preening their feathers just out of easy gunshot. Pintail, Wigeon, Teal, and Scaup associated amicably together, and on one occasion we watched a Swan which had joined a similar party. The Scaup is most active when the sun shines from the north; that seems to be its favourite feeding-time; and then its loud, harsh scream may be heard, as the drake calls to his mate to leave her eggs covered warmly up in a blanket of down, and to come away from her snug nest among the bilberries on the adjacent bank-side and join him on the lake, or perhaps have a swing down the river to the delta to pick up anything that may be left on the strand at low tide. Of all the cries of the Ducks that have come under my notice, I think that of the Scaup is the most discordant. None of them are very musical, perhaps; but if you imagine a man with an exceptionally harsh, hoarse voice screaming out the word *scaup* at the top of his voice, some idea of the note of this Duck may be formed. It is said that when this harsh note is uttered the opening of the bill is accompanied with a peculiar toss of the head. The ordinary alarm-note during flight is a grating sound like that made by the Tufted Duck.

The Scaup is a very gregarious and sociable bird. In winter it is almost always seen in flocks, frequently associated with other Ducks, and in summer small parties are constantly seen coming to and going from their feeding-grounds. When alarmed they generally seek safety by diving, but if they find themselves obliged to take wing they get up from the water, one after another, with a great splash; but once fairly launched in the air, they seem

to get away very quickly, though their wings are obliged to vibrate at a great speed and with considerable noise. They both swim and dive with perfect ease, and obtain much of their food under water.

Although the Scaup, when cooked, is said to taste very fishy, it does not appear to be much of a fish-eater. Shell-fish are its favourite food, but it varies this diet with crustaceans, the larvæ of various insects, and with some vegetable matter. In confinement, Montagu found it remarkably tame, feeding eagerly at once on soaked bread, and after a few days on barley.

The Scaup generally selects some sloping bank, not far from water, but high enough from the edge to be secure from floods, on which to build her nest. It is always well concealed, and seldom to be found except by accidentally frightening off the sitting Duck. Sometimes it is placed under the cover of a willow or a juniper bush, but more often in the open, carefully hidden in some hole in the rough ground, surrounded by cranberries or bilberries struggling amidst tufts of sedge or cotton-grass. The hole is lined with dry broken sedge, and as the eggs are laid an accumulation of down is formed sufficient to keep them warm when the Duck leaves them to feed.

The eggs of the Scaup are from six to nine in number, pale greenish grey, almost the same colour as the typical egg of the Pheasant. They vary in length from 2·7 to 2·4 inch, and in breadth from 1·75 to 1·65 inch. The down is as large as that of the Mallard, dark brown, without pale tips, but with obscure pale centres. Small eggs of the Scaup are indistinguishable from large eggs of the Pochard, but the down of the latter bird is a greyer brown.

The Scaup is always a migratory bird: the young leave the place of their birth in August, and by the end of September their parents have also deserted their breeding-grounds, which are generally ice-bound early in October. In Iceland, where the winters are mild, the old birds linger on into October, and return again late in March; but in North Europe and Asia their breeding-grounds are buried six feet deep in snow until the last week of May or the first week of June. In the valley of the Petchora we got full clutches of fresh eggs on the 25th of June and the 4th of July, but in Iceland this Duck breeds a week or two earlier.

The adult male Scaup in nuptial dress has the entire head, neck, upper breast, upper mantle, rump, upper and under tail-coverts black, glossed with green or purple, according to the position in which it is held, especially on the head; the lower mantle, scapulars, wing-coverts, innermost secondaries, lower belly, and most of the under wing-coverts are vermiculated with very dark brown and white, the white predominating on the scapulars, and the brown on the wing-coverts and innermost secondaries. The secondaries are white, with brownish-grey tips, and the primaries are greyish brown, with

not quite so much white on the basal portion as in the other Pochards. Bill slate-grey, blackish on the nail; legs and feet slate-grey, darker on the webs; irides yellow. The adult female, like that of the preceding species, closely resembles the adult male in the general distribution of its colours, and has all the black feathers replaced by brown ones; the white vermiculations on the upper parts are reduced to mere traces near the ends of the brown feathers; the white flanks are replaced by brown, and the vermiculation on the lower belly is nearly obsolete, being apparently transferred to the under tail-coverts; all the feathers round the base of the bill are nearly white, and there is an obscure white patch at the end of the ear-coverts. Young in first plumage resemble adult females in the colour of the upper parts, except that the traces of vermiculation are almost obsolete; the white round the base of the bill is more or less suffused with brown; the vermiculations on the underparts have entirely disappeared; the brown feathers on the breast are margined with white; and the white feathers of the belly are obscured with brown. Young males are distinguished from females by having the white at the base of the bill almost as clearly defined as in the adult female, and are otherwise somewhat darker and richer in colour. Males in first nuptial dress have less green metallic gloss on the head and neck; the black breast-feathers have white margins; the white flanks and the black under tail-coverts are more or less vermiculated, as is also the black upper mantle, whilst in the vermiculations of the lower mantle, scapulars, and wing-coverts the dark brown predominates over the white. Males in moulting-plumage closely resemble adult females, and are intermediate in colour between adult females and males in first nuptial dress. Young in down closely resemble those of the Tufted Duck; they are dark brown on the upper parts, shading into nearly white on the belly.

FULIGULA CRISTATA.

TUFTED DUCK.

(Plate 64.)

Anas glaucium minus, *Briss. Orn.* vi. p. 411 (1760).
Anas fuligula, *Linn. Syst. Nat.* i. p. 207 (1766).
Anas cristata, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 39 (1816); et auctorum plurimorum—(*Selby*), (*Jenyns*), (*Bonaparte*), (*Keyserling & Blasius*), (*Gray*), (*Dresser*), &c.
Nyroca fuligula (*Linn.*), *Flem. Phil. Zool.* ii. p. 260 (1822).
Aythya fuligula (*Linn.*), *Boie, Isis*, 1822, p. 564.
Fuligula cristata (*Leach*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 190 (1824).
Aythya cristata (*Leach*), *Brehm, Vög. Deutschl.* p. 916 (1831).

The Tufted Duck is one of the seven species of freshwater Ducks which breed regularly in England. It is a winter visitor to most of the low-lying coasts of the British Islands, and to many secluded lakes and ponds, but during the breeding-season it is very local. It is most abundant in Sherwood Forest, on the chain of little lakes which lie between Newstead Abbey and Clumber Park in Nottinghamshire, but breeds in some numbers in the meres of South Norfolk. It has also been recorded as occasionally breeding in Sussex, Hertfordshire, Shropshire, Yorkshire, and Northumberland. In Scotland it is known to breed in Perthshire and in some of the adjacent counties. It has been found breeding in several counties in Ireland, but is only known as a winter visitor to the Orkney and Shetland Islands, though it has since bred on the Faroes.

On the continent the range of the Tufted Duck is very extensive, reaching from the Atlantic to the Pacific, but it appears to be confined to the Old World, though it is said to have occurred in Greenland. North of the Arctic circle it is very rare, but further south it breeds in considerable numbers in most suitable localities as far as latitude 50°. In Norway it has been obtained as far north as latitude 70°, in the valley of the Yenesay in latitude 68°, and on the Pacific coast in latitude 62°. In Naumann's days a few pairs bred in Mecklenburg, and it formerly bred in Denmark and Pomerania. It still breeds in Scandinavia, the Baltic Provinces, and North Russia, and is common throughout South Siberia. It winters in South Europe, North Africa as far south as Abyssinia, and the whole of Southern Asia including Japan, but not ranging as far as Ceylon or the other islands south of Formosa, nor to the Burma peninsula.

It is represented on the American continent by a perfectly distinct species, *Fuligula collaris*, which, besides having a much shorter crest and a somewhat differently coloured bill, has the wing-speculum pale slate-grey instead of white, and has a chestnut collar round the neck.

Although the Tufted Duck is found on the coast in winter, it is exclusively a freshwater Duck during the breeding-season. It prefers lakes to rivers, and may often be seen on very small ponds if they are secluded enough and weed-grown at the bottom. Such pieces of water are usually surrounded with rushes, sedge, and flags, and often with reeds; but the Tufted Ducks are generally seen in shallow open places, where they dive into the water and having torn up a bunch of weed from the bottom, proceed leisurely to pull it to pieces as it lies floating on the surface. The winter visitors arrive in our islands early in November, soon after the male has resumed his nuptial dress and the female has completed her autumn moult, and leave again towards the end of March. They migrate by night, and frequently during the periods of migration large flocks suddenly appear on lakes where not a bird was to be found the previous evening.

In no part of England is the Tufted Duck so abundant during the breeding-season as in the old haunts of Robin Hood. The district is well preserved, and during the critical period of nesting the birds are absolutely undisturbed, and each pair usually rear nearly a dozen young ducklings. Now and then one may fall a victim to some voracious pike, but they have little to fear from poachers or birds of prey. The property is mostly in the hands of large landed proprietors, under whose protection the Ducks appear to thrive, although every autumn a murderous fire is opened upon them and other game, which possibly restores the balance of Nature, which the destruction of the birds of prey would otherwise disturb. My first acquaintance with the Tufted Duck was made in this district five-and-twenty years ago at Clumber; and more recently I have been indebted to the kindness of my friend Mr. Whitaker, of Rainworth Lodge (within twenty yards of which they breed), for an opportunity of examining their habits more closely. One of the tributaries of the Idle river rises in a large wood on the Newstead estate, and flows through a succession of little lakes, ponds, and swamps, where the Tufted Duck may be seen all the year round. Mr. Whitaker estimates the number of pairs breeding in this district at more than a hundred. It is not an uncommon thing to see five or six pairs on each pond besides Mallard and Shoveller, numerous Waterhens and Coots, and a few Grebes. The Tufted Duck pairs in March, and is seen in pairs until early in June, when the female begins to sit. At this season the male is devotedly attached to her, and the pair are always seen together. They are not very wild, and may be approached with care within a comparatively short distance. The male is the first to show any alarm, and sometimes swims backwards and forwards, showing his anxiety to his more stolid mate,

but never venturing to take wing until she has risen from the water, and then following her to the next pond, or in her circuitous course up to the head of the water, when she will often wheel round, and passing behind any cover that may happen to be on the side of the pond, drop down again with her faithful attendant not far from the spot where she was originally disturbed. During the daytime they are very quiet, floating on the water near the middle of the pond, sometimes sleeping with their heads under their wings, and occasionally lazily preening their feathers. When at rest the male is very conspicuous, and seems to float very light on the water, his white breast-feathers fluffed up over his wings so as almost to hide them. Sometimes as he leans over on the side away from the observer he looks quite white, and then as he rolls back again to preen the other side he suddenly changes into black. When his head is erect, the black crest is easily seen. Towards evening they begin to feed. Exactly as twilight marks the approach of night, they rise from the pond where they have spent the day, and fly up stream to other ponds to feed, returning in the morning; Whitaker says, "flying at a great pace and a good height in the air. In the morning, after their return to the ponds, they may be seen actively diving for weeds, usually remaining under water about fifteen seconds, and resorting to the middle of the pond. In the afternoon they rest or may be seen preening their feathers, but towards flight-time they become restless, frequently calling and taking short flights until the time arrives to go, when with loud cries they rise together, and rush on swift pinions to their breeding-places."

The flight is strong and rapid, and the quick beat of the wings against the air can be heard at some distance. They are easy to shoot, as they fly close to the water for some distance after rising. Both when they rise from the water and when they settle again the two sexes call to each other with a harsh grating cry, *kr-kr-kr*.

The Tufted Duck is a late breeder; in Nottinghamshire the eggs are seldom laid before the end of May or, in late seasons, the beginning of June, but in Norfolk they are at least a fortnight earlier. On the 14th of May last year Lord Walsingham showed me two nests at Thompson Mere on the Merton estate, one containing six eggs and the other two; the former nest also contained the egg of a Pochard, and there was a nest of that species of Duck, containing ten eggs, not many yards away. The nest is sometimes placed under a bush by the side of a pond, sometimes amongst the rushes, and often in the centre of the tufts, tussocks, or hassocks of sedge, which grow to a height of two or three feet above the water. It is a mere hollow lined with dry sedge or grass, and after the full complement of eggs are laid, and the duck has begun to sit, with down. The number of eggs is usually ten or twelve, but sometimes only eight are laid, and occasionally as many as thirteen. They vary in length from 2·4 to 2·15

inch, and in breadth from 1·65 to 1·55 inch. They scarcely differ in colour from those of the Scaup, Pochard, and Pheasant. The down is greyish black, with very obscure white centres, but without white tips; it is both smaller and darker than that of the Pochard, an important point of identification, as small eggs of that species are indistinguishable from large eggs of the Tufted Duck.

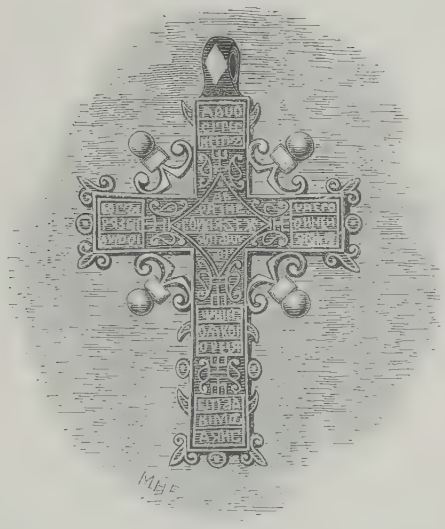
After the young are hatched, they are carefully tended by the female, who does not lead them amongst the rushes on the approach of danger, as most Ducks do, but calls them into the middle of the pond. Whitaker assures me that the male bird is never seen with the female and the young brood. Although he has moulted into a plain plumage, to all appearance expressly for the purpose of tending his young family without exposing them to danger by the conspicuousness of his dress, he neglects his parental duties, preferring the society of his own sex until pairing-time comes round again. His sole object, like that of other drakes, in assuming the female plumage is the selfish one of making himself as inconspicuous as possible whilst he performs the important operation of moulting his quills and tail-feathers.

The food of the Tufted Duck consists of water-insects of all kinds and small shell-fish; but this diet is varied with the tender shoots of various aquatic plants, and small stones are found in its gizzard.

The Tufted Duck is very gregarious in winter. In the Mediterranean it is sometimes seen in very large flocks, especially on the sea-coast, but wherever it can obtain suitable feeding-grounds inland, even in winter, it eagerly avails itself of them. Jerdon describes it as frequenting open tanks during the cold season in India, generally in small parties, and he specially mentions its habit of keeping well away from the edges.

The Tufted Duck is rather larger than the Wigeon. The adult male in full nuptial dress scarcely differs in colour from the adult male Scaup, except that the vermiculations on the upper parts are confined to obscure traces on the mantle and scapulars resembling buffish-white dust. It is further distinguished by having a conspicuous crest of filamented feathers confined to the centre of the crown. Bill slate-grey, black at the tip; legs and feet bluish grey, darker on the webs; irides bright yellow. The adult female, like those of the two preceding species, closely resembles the adult male in the general distribution of its colours, and has all the black feathers replaced by brown (with the exception of the outer webs of the innermost secondaries, which are glossed with green as in the male), which is less clearly defined from the white belly than it is in the male and also extends to the flanks; the crest is also smaller. Young in first plumage closely resemble adult females, but are paler brown, especially on the chin and throat, and have no metallic green gloss on the innermost secondaries. There are more white feathers

on the breast and a considerable number near the base of the bill. Males may be distinguished from females by being somewhat darker in colour on the upper parts, somewhat whiter on the belly, and with more indication of a crest. Males in first nuptial dress have white margins to the black feathers of the breast, little or no green gloss on the head and neck, shorter crests, vermiculated flanks, and a small white spot on the chin. Males in moulting-plumage are intermediate in colour between males in first plumage and males in first nuptial plumage. Young in down are dark brown, shading into nearly white on the belly.



FULIGULA ALBEOLA.

BUFFEL-HEADED DUCK.

Anas hyberna,
Anas querquedula ludoviciana,
Anas querquedula carolinensis, } *Briss. Orn.* vi. pp. 349, 461, 464 (1760).
Anas albeola, *Linn. Syst. Nat.* i. p. 199 (1766); **et auctorum plurimorum**—(*Nuttall*), (*Coues*), (*Baird, Brewer, & Ridgway*), (*Dresser*), (*Saunders*), &c.
Anas bucephala,
Anas rustica, } *Linn. Syst. Nat.* i. pp. 200, 201 (1766).
Clangula albeola (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 184 (1824).
Fuligula albeola (*Linn.*), *Bonap. Ann. Lyc. Nat. Hist. N. York*, ii. p. 394 (1826).
Bucephala albeola (*Linn.*), *Baird, B. N. Amer.* p. 797 (1858).

The Buffel-headed Duck was first recorded as a British bird by Donovan in 1819, though no particulars are given; but an example was shot near Yarmouth in the winter of 1830 (Lubbock, 'Fauna of Norfolk,' p. 119). An example in the Margate Museum, said by Yarrell to have been obtained in Orkney, proved afterwards to have been set up from a foreign skin.

Harting ('Handbook British Birds,' p. 161) records an example which he examined, and which, he was informed, had been killed in the winter of 1841 at West Mud, near Devonport, in Devonshire; but doubt has since been thrown on the authenticity of this specimen.

A third British example was shot in the winter of 1864–65 at Bessingly Beck, near Bridlington, in Yorkshire (Cordeaux, 'Zoologist,' 1865, p. 9659). An example in the British Museum, labelled Norfolk, can scarcely be regarded as authentic.

Scotland claims to add a fourth and fifth British-killed Buffel-headed Duck to the list (Gray, 'Birds of the West of Scotland,' p. 396). A male is said to have been shot on the Loch of Loriston, in Aberdeenshire, in January 1865, and another male is in the Banff Museum, which is said to have been shot in the Loch of Strathbeg forty or fifty years ago.

According to the old proverb, which says that "what is hit is history, but what is missed is mystery," the occurrence of the Buffel-headed Duck in Ireland must still be regarded as mysterious; but there is strong evidence in its favour (Payne-Gallwey, 'Fowler in Ireland,' p. 110).

The Buffel-headed Duck breeds throughout Arctic America up to the limit of forest-growth, wintering in the United States, the West Indies, and on the coasts of Mexico. It has once been obtained in Greenland, and

occasionally visits the Bermudas, but there is no evidence that it has ever occurred on any part of the continent of Europe.

The Buffel-headed Duck has no ally nearer than the Golden-eye, and resembles that species in most of its habits, especially in its choice of a nesting-place. It breeds in hollow trees, sometimes as high as twenty feet from the ground, and occasionally in the hollow of a fallen log on the level of the ground. Like the Golden-eye, it makes no nest, but lays its eggs on the rotten wood, with abundance of down plucked from its own breast. Its food consists of grass, mollusks, and other marine animals and vegetation. Its note is described as a mere croak, feebler than that of the Golden-eye.

The eggs of the Buffel-headed Duck are from six to ten in number, pale greenish grey in colour, and vary in length from 2·05 to 1·95 inch, and in breadth from 1·5 to 1·35 inch. They very closely resemble eggs of the Gadwall (figured on Plate 66), but it is probable that the down is quite different to that of this bird. The Buffel-headed Duck, breeding in hollow trees, has doubtless pale grey down like that of the Golden-eye.

The Buffel-headed Duck is not much larger than a Teal, and might be broadly described as a small Golden-eye, with the white patch on the side of the head very large, and situated behind the eye instead of in front of it. The females of the two species also closely resemble each other, but, in addition to the smaller size, the female Buffel-head may be at once distinguished by the large white patch on the side of the head, extending from the eye across the ear-coverts. In the Golden-eye there is no such white patch on the head, which in the female is of a uniform brown. American ornithologists have neglected the obvious duty of describing the immature plumage.

FULIGULA CLANGULA.

GOLDEN-EYE.

(Plate 63.)

Anas glaucium, *Briss. Orn.* vi. p. 406 (1760).
Anas clangula, *Linn. Syst. Nat.* i. p. 201 (1766); **et auctorum plurimorum**—*Gmelin, Latham, Temminck, Leach, Vieillot, Naumann, Schlegel,* (*Audubon*), (*Coues*), &c.
Anas glaucion, *Linn. Syst. Nat.* i. p. 201 (1766).
Anas peregrina, *Gmel. Reise Russl.* ii. p. 183, pl. 16 (1774).
Clangula clangula (*Linn.*), *Flem. Phil. Zool.* ii. p. 260 (1822); *Boie, Isis*, 1822, p. 564.
Clangula chrysopthalmos, *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 182, pl. 56 (1824).
Fuligula clangula (*Linn.*), *Bonap. Ann. Lyc. Nat. Hist. N. York*, ii. p. 393 (1826).
Clangula vulgaris, *Flem. Brit. An.* p. 120 (1828).
Glaucion clangula (*Linn.*), *Kaup, Natürl. Syst.* p. 53 (1829).
Clangula glaucion (*Linn.*), *Brehm, Vög. Deutschl.* p. 929 (1831).
Bucephala clangula (*Linn.*), *Coues, Key N.-Amer. B.* p. 290 (1872).

The Golden-eye is a common and regular winter visitor to the British Islands, being most abundant in the northern districts, especially on the north and west coasts of Scotland, including the Orkneys, Shetlands, and the Hebrides. In England it is observed in most abundance during severe winters, nevertheless it is a well-known bird in most suitable localities. In Ireland it is equally well known and, as in the rest of the United Kingdom, frequents the inland lakes and rivers as well as the coast, in many cases showing a decided preference for them. It is said to have bred at Loch Assynt in Sutherlandshire, and Saxby believed that it did so in Shetland.

The Golden-eye is a circumpolar bird, breeding in the Arctic and semi-Arctic regions of both continents up to the limits of forest-growth. In Europe the southern limit of its breeding-range appears to be North Germany, Pomerania, and the Caucasus, whilst in Asia it breeds throughout Siberia. It winters on the coasts of Western Europe and in the basin of the Mediterranean, though it is said to be very rare on the southern shores of that sea. It also winters in the Black Sea and on the southern shores of the Caspian. It is said to be a resident on Lake Baikal; but most of the Siberian birds migrate to Mongolia, where a few remain to winter, the rest passing on to China and Japan. On the American continent it breeds in Alaska and British North America, and winters in the Southern States, Mexico, and Cuba. A few remain to winter on the southern coasts of Alaska. American examples of the Golden-eye are said to be somewhat larger than those of the Old World, and have

been distinguished under the name of *Fuligula glaucion americana* *; but the evidence in proof of this assertion is very unsatisfactory. The nearest ally of the Golden-eye is Barrow's Golden-eye (*F. islandica*), an American species having nearly the same geographical distribution as that of the Golden-eye on that continent, but extending to Greenland and Iceland. The most striking point of distinction between the two species is that in Barrow's Golden-eye the white on the sides of the head extends in a crescent above the base of the bill in front of the eye.

The Golden-eye is a resident where open water is to be found in its breeding-quarters all the year round; but as this is very rarely the case, never in the northern portions of its range, and only in exceptionally mild winters in its most southerly breeding-haunts, it may fairly be regarded as a migrant. On the Arctic circle it is only to be found from the end of May to the beginning of October; but in Finland, in lat. 62°, it has eggs in the last week of May. In England it is found from the middle of October to the middle of April.

The Golden-eye chooses for its breeding-grounds a combination of forest, lake, river, and marsh, and when the ice drives it southwards it prefers a similar locality; but if such be not easily found it whiles away the winter months on the sea-coast. It is remarkable for its noisy flight, its rapidly moved wings whistling in the wind as it passes overhead. It makes also a great splashing in the water when it rises, but does not readily take wing, as it is a most expert swimmer and diver. It is one of the shyest of Ducks and very difficult to shoot. It makes the same grating sound when calling to its fellows during flight as the Scaup and the Tufted Duck. It is a clumsy walker on the land, and lives almost entirely on the water, feeding on nearly every kind of both animal and vegetable food that its unrivalled powers of diving enable it to find at the bottom: small fish, young frogs, shell-fish, insects, the seeds and buds or tender leaves of water-plants, nothing comes amiss to it.

But the most remarkable fact in the history of the Golden-eye is its habit of occasionally perching on the bare branch of some forest tree, and of discovering a hole in the trunk, sometimes quite a small one, but leading to a hollow inside, where it deposits eggs on the rotten chips of wood without any nest, like a Woodpecker. These breeding-places are sometimes a considerable distance from the ground. In the valley of the Petchora I have seen one at least five-and-twenty feet from the ground; but one I saw in the valley of the Yenesay was not more than half as high. It has been

* The synonymy of the American form is as follows:—

Clangula americana, *Bonap. Comp. List B. Eur. & N. Amer.* p. 58 (1838).
Bucephala americana (*Bonap.*), *Baird, B. N. Amer.* p. 796 (1858).
Clangula glaucium americana (*Bonap.*), *Ridgw. Proc. U.S. Nat. Mus.* iii. p. 204 (1880).

seen to convey its young one by one down to the water pressed between its bill and its breast. In many places the natives take advantage of this choice of a nesting-site and put up boxes with small entrance-holes in the side. It is glad enough to avail itself of these convenient situations, but generally pays the penalty of its trustfulness by having its eggs robbed by the hard-hearted peasants. To rob a nest for the sake of a museum that may give pleasure to hundreds of students for scores of years is one thing, but to do so for sport or food is another. Where a hollow tree-trunk cannot be found a hollow branch is often selected, and in some parts of Germany where the forests are far too well farmed to admit of the existence of hollow trees, the Golden-eye, according to Naumann, breeds on the tops of pollard willows or even amongst the reeds on the ground. The down, like that of the Smew or the Sheldrakes and other Ducks which breed in hollow trees or holes in the ground where it cannot be seen, is much paler than that of Ducks generally, being a delicate pale lavender-grey with very obscure paler centres. The eggs vary from ten to nineteen, but thirteen is a not unusual number. They are bright greyish green, smooth in texture, and with considerable gloss. They vary in length from 2·4 to 2·1 inch, and in breadth from 1·75 to 1·55 inch. Exceptionally grey eggs of the Golden-eye can scarcely be distinguished from exceptionally green eggs of the Pochard; but the difference in the colour of the down makes confusion between them impossible.

The Golden-eye is about as large as the Pintail. The adult male in full nuptial dress has the head and upper neck black, glossed with purple on the forehead and throat and with green on the other parts, though in certain lights these colours may be reversed; it has a large white spot between the base of the bill and the eye; the back, rump upper tail-coverts, the margins of the scapulars, the innermost secondaries, the lesser wing-coverts, the primaries and the first two or three secondaries, the axillaries and under wing-coverts, the tail, and the feathers round the thighs are black, the latter having white tips; the whole of the rest of the plumage is white; the scapulars (which are, as has been already described, white broadly margined with black) and the feathers of the lower flanks (which are broadly margined with black on their outer webs) are elongated into what might be termed nuptial plumes; and the feathers of the hind head and nape are somewhat filamented and slightly elongated, forming the rudiments of a crest. Bill black; legs and feet orange-yellow, webs dusky; irides yellow. The adult female has the head and upper neck uniform brown, the rest of the feathers of the upper parts being nearly black, with pale slate-grey margins to those of the mantle and scapulars; and a dull white ring passes round the lower neck. The central secondaries are pure white, the greater wing-coverts are white tipped with dark brown, and the median wing-coverts are tipped with white. The breast and flanks

are slate-grey, each feather with an obscure white margin; the rest of the underparts are pure white; axillaries and under wing-coverts brown. It is a much smaller bird than the male, measuring an inch less in length of wing. Young in first plumage closely resemble adult females, but are somewhat duller in colour, the pale ring round the neck is much more obscure, the feathers on the breast have white margins, and the feathers round the thighs are brown. There is no white on the wing-coverts of the female; but in the male they are somewhat more white than in the adult female. The males are further distinguished by their larger size. Males in first nuptial dress have less white on the scapulars; the white on the hind neck is mottled with brown, as is also the white spot on the lores. Males in moulting-plumage resemble adult females, except that they retain the whiter wing of the adult male. Young in down are dark brown on the upper parts, and paler brown on the breast and flanks, shading into white on the throat, and into pale grey on the belly.

Barrow's Golden-eye (*Fuligula islandica*) is included in 'The Ibis' list of British birds, in large type, without brackets, which, upon reference to the preface, will be found to signify that the species is "regarded as positively authenticated as British." It is stated that "one was shot at the mouth of the Derwent, out of a flock of five, in the winter of 1863–64 (Zool. 1864, p. 9038)." The further information is added that this species is "found only in the northern portions of the Palæarctic and Nearctic Regions." In reference to these quotations I have to remark, first, that the only portion of the Palæarctic Region where Barrow's Golden-eye has been found is Iceland; second, that the information of its occurrence in Britain is given on the authority of Graham, the York bird-stuffer, who is known to have been unreliable; third, the alleged specimen is stated to be a female, which so nearly resembles the female Golden-eye that Baird, Brewer, and Ridgway are obliged to acknowledge their inability to give infallible points of distinction; fourth, I cannot find any record of the bird having been shot out of a flock of five; but the Committee may have had access to information which I have not been able to discover. Comment is needless!!

Barrow's Golden-eye also breeds in hollow trees; but in localities where these are not so be found, it conceals its nest in cracks and crevices of the rocks or in holes in turf walls.

FULIGULA HISTRIONICA.

HARLEQUIN DUCK.

(Plate 65.)

Anas torquata ex insula terræ novæ, } *Briss. Orn.* vi. pp. 362, 469 (1760).
Anas querquedula freti hudsonis, }
Anas histrionica, *Linn. Syst. Nat.* i. p. 204 (1766); **et auctorum plurimorum**—*Gmelin, Latham, (Temminck), (Bonaparte), (Dresser), (Saunders),* &c.
Anas minuta, *Linn. Syst. Nat.* i. p. 204 (1766).
Clangula histronica (*Linn.*), *Boie, Isis,* 1822, p. 564.
Fuligula (Clangula) histrionica (*Linn.*), *Bonap. Ann. Lyc. Nat. Hist. N. York* ii. p. 394 (1826).
Histrionicus histrionica (*Linn.*), *Less. Man. d'Orn.* ii. p. 415 (1828).
Cosmonessa histrionica (*Linn.*), } *Kaup, Natürl. Syst.* pp. 46, 196 (1829).
Cosmenetta histrionica (*Linn.*), }
Fuligula histrionica (*Linn.*), *Nutt. Man. Orn.* ii. p. 448 (1834).
Harelda histrionica (*Linn.*), *Keys. & Blas. Wirb. Eur.* p. lxxxvii (1840).
Phylaconetta histrionica (*Linn.*), *Brandt, Mém. Ac. St. Pétersb.* vi. p. 9 (1849).
Clangula torquata, *Brehm, Vögelfang,* p. 385 (1855).
Histrionicus torquatus (*Brehm*), *Bonap. Compt. Rend.* xliii. p. 651 (1856).
Bucephala histrionica (*Linn.*), *Gray, Hand-l. B.* iii. p. 87 (1871).
Histrionicus minutus (*Linn.*), *Dresser, B. Eur.* vi. p. 613 (1877).

The Harlequin Duck has only a very questionable right to the title of "British bird." Upwards of a score examples have been recorded as British, but the researches of Mr. J. H. Gurney have shown that not more than three of this long list are trustworthy ('Rambles of a Naturalist,' p. 263). This bird was first recorded as British by Montagu in 1802, who states, in his 'Ornithological Dictionary,' that he had examined a pair which were killed on Lord Seaforth's estate (presumably in the island of Lewis) in Scotland, and presented to Mr. Sowerby, of London. The other example, about which no reasonable suspicion lingers, was killed in Aberdeenshire in 1858. It was a male in full plumage, and was shot whilst swimming close in shore after a storm (Gray, 'B. of West of Scotland,' p. 394, and Gurney, 'Rambles of a Naturalist,' p. 265). These examples may fairly be regarded as accidental wanderers from Iceland, as, according to Sclater (Proc. Zool. Soc. 1880, p. 527), this species has never been kept in confinement. The Harlequin Duck has been said to breed in captivity (Brigge, 'Zoologist,' 1850, p. 2949); but there is every reason to believe that the bird alluded to was the Wood or Summer Duck, *Anas sponsa,* of North America, as was shown by Newton ('Ibis,' 1859, p. 166).

Clarke and Roebuck record no less than three examples of this Duck as

having been captured in Yorkshire, viz. one on the river Don above Doncaster, one at Filey (now in the collection of Mr. Whitaker), and a third at Hornby Decoy; but the evidence either of their authenticity or identification is far from being satisfactory (Handbook Vert. Fauna Yorksh. p. 57).

The Harlequin Duck is almost a circumpolar bird. It is a resident in Iceland, and a summer visitor to Greenland south of the Arctic circle; thence its breeding-range extends westwards between lat. 45° and 65° across North America. It winters in considerable numbers on the great American lakes, but on the Aleutian Islands it is a resident. In Eastern Siberia its breeding-range extends from the Stanavoi Mountains through the valley of the Amoor as far west as Lake Baikal. The only evidence of its breeding west of Lake Baikal in the Old World is that of Sabanäeff, who states that it breeds in the Ural and in the Government of Yaroslav. Eversmann also records it from the Ural Mountains, and Nordmann from Finland; Henke says that it is a rare summer visitor to Archangel, and it has occurred once in Sweden, but it is doubtful whether it has ever visited Norway. The East-Siberian birds seldom migrate further south than the Kurile Islands and Yezo, though they are occasionally found on the shores of the main island of Japan. It has no near ally.

The habits of the Harlequin Duck are very imperfectly known. During the breeding-season it frequents the most secluded spots on the banks of rivers, preferring the small tributaries to the main stream. It loves to haunt the rapid-flowing torrents and the broken water below falls, and is said to be most abundant at the mouths of the rivers it frequents. Dall, describing its habits in Alaska, says that it is a comparatively solitary bird, living in pairs, and is rarely seen in small flocks; but Elliott states that on the Pribylov Islands further north it is generally seen in flocks of fifty or sixty. It dives with great ease and quickness, often gambolling in the water or chasing its mate for mere amusement. When alarmed, it generally dives instantly, and swims with its body hidden entirely under water, or with only its head exposed. Its flight is powerful and swift, and it swims quickly and buoyantly, sitting moderately high out of the water. Its food consists of small mollusks, and it often dives for a considerable distance to pick them from the rocks. It also eats marine insects, small fish, and the buds, leaves, and seeds of water-plants. It is said by Mr. H. W. Elliott to be a very silent bird; but Naumann states, on the authority of Faber, that it is a remarkably noisy one, especially in spring.

There is no reliable information respecting the nesting-habits of the Harlequin Duck. In South Siberia the eggs are laid from the end of May onwards; and Middendorff found the young in down, not far from the mouth of the Amoor, on the 5th of July. In Iceland the eggs are laid early in June. In the Rocky Mountains, Coues found the young still

unable to fly at the end of August. The Harlequin Duck has been erroneously stated to breed in holes in trees on the banks of the swift-flowing streams it frequents; but there is no evidence of any kind in support of this statement. Krüper* was informed that in Iceland it makes its nest on the ground, close to the water's edge, but always so carefully concealed as to be discovered with difficulty. Shepherd describes it as nesting in holes on the banks of the river Laxe, which connects lake Myvatn with the sea; but in none of these cases does the information respecting the nest of this bird appear to have been obtained from personal observation. The eggs of the Harlequin are from eight to ten in number, creamy white, smooth in texture, and glossy. They vary in length from 2·4 to 2·1 inch, and in breadth from 1·75 to 1·6 inch. The down of the Harlequin Duck taken from the nest appears to be undescribed, but, to judge from that on the body of the bird, it is darkish grey, much paler than that of the Gadwall. The eggs cannot readily be confused with those of any other British bird, as they are always larger and heavier than those of the Wigeon and Smew.

In winter the Harlequin Duck frequently retires to salt water, haunting the quiet bays and rock-bound coasts, where it can obtain a supply of suitable food. It then becomes rather more sociable and gregarious, often mingling with Long-tailed Ducks, or uniting into small parties, the broods and their parents keeping together in some cases during the winter. Elliott found this Duck common on the shores or in the adjoining sea of the Pribylov Islands. He saw them in flocks floating amongst the surf, or standing preening their feathers on the beach and outlying rocks. He never heard them utter a note at any time of the year. They were not very wild or shy, and the natives killed numbers of them in spring and autumn. The flesh of this bird is said not to be very palatable, although Wilson seemed to be of a different opinion.

The male Harlequin Duck, as its name implies, is conspicuous by the eccentricity of the colours of its plumage, and by the startling contrasts they present, rather than for their beauty. Assuming this to be an instance of sexual selection, it must be admitted that the taste of the female is very loud. The Harlequin is slightly larger than the Wigeon. The adult male, in nuptial dress, has the general colour of the plumage slate-grey, shading into black on the rump and upper and under tail-coverts, and into brown on the centre of the belly; a large patch of white at the base of the bill recalls a similar feature in the plumage of the Golden-eye, but in the Harlequin it is prolonged into a narrow streak on each side of the crown, which is emphasized by chestnut streaks beneath, which meet on the nape, whilst above and between them

* Krüper's remarks on the nest and down of Barrow's Golden-eye have been inadvertently transferred to this species by Saunders, in the fourth edition of Yarrell's 'British Birds.'

a black streak reaches from the base of the bill to the nape; beyond the ear-coverts is an irregular oval white patch; on each side of the neck a broad stripe of white; round the lower neck a white ring; on the sides of the breast another white stripe; two smallish white spots on the wing, one on the lesser wing-coverts and one on the tips of the greater wing-coverts; a longitudinal stripe of white on the scapulars; triangular white markings on the outer webs of the innermost secondaries, which are filamented; and a white spot on the outermost under tail-coverts; except the spot on the lesser wing-coverts and the stripe on the scapulars, these eccentric white markings are emphasized by a margin of black; axillaries and under wing-coverts brown; flanks chestnut; the wings and tail-feathers are brown, with a metallic purple speculum on the central secondaries. Bill dark slate-grey, paler on the nail; legs and feet brown, darker on the webs; irides hazel. The adult female is an almost uniform brown, with an obscure white patch between the eye and the bill, separated into two by a brown line across the lores; a similar obscure white patch is to be found on the neck, and the breast and belly are mottled with white. Young in first plumage closely resemble adult females, but are more suffused with brown on the breast and chin and on the white spot between the eye and the bill. Young males are slightly darker than females on the upper parts. Males in first nuptial dress are mottled with white on the chin and throat, the belly is suffused with brown, and there is scarcely any chestnut on the flanks, and the white on the scapulars is very restricted. Males in moulting-dress are doubtless intermediate in colour between males in first plumage and males in first nuptial plumage; but examples in moulting-plumage appear to be unknown. Young in down are described and figured by Middendorff as having the upper parts dark brown, abruptly defined from the white underparts, but extending slightly on the breast and flanks, and with a pair of white spots on the side of the rump, and a second pair on the wings.

FULIGULA GLACIALIS.

LONG-TAILED DUCK.

(Plate 66.)

Anas longicauda islandica,
Anas longicauda ex insula terræ novæ,
Anas querquedula ferroënsis, } *Briss. Orn.* vi. pp. 379, 382, 466 (1760).
Anas hyemalis, *Linn. Syst. Nat.* i. p. 202 (1766).
Anas glacialis, *Linn. Syst. Nat.* i. p. 203 (1766); **et auctorum plurimorum**—*Gmelin, Latham, Temminck, (Bonaparte), (Dresser), (Saunders)*, &c.
Anas miclonia, *Bodd. Tabl. Pl. Enl.* p. 58 (1783).
Anas longicauda, *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 37 (1816).
Anas brachyrhynchos, *Beseke, Vög. Kurl.* p. 50, pl. 6 (1821).
Clangula glacialis (*Linn.*), *Boie, Isis*, 1822, p. 564; *Flem. Phil. Zool.* ii. p. 260 (1822).
Platypus glacialis (*Linn.*), *Brehm, Lehrb. eur. Vög.* ii. p. 840 (1824).
Harelda glacialis (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 175 (1824).
Fuligula glacialis (*Linn.*), *Bonap. Ann. Lyc. Nat. Hist. N. York*, ii. p. 395 (1826).
Pagonetta glacialis (*Linn.*), *Kaup, Natürl. Syst.* p. 66 (1829).
Clangula hiemalis (*Linn.*), *Brehm, Vög. Deutschl.* p. 933 (1831).
Crymonessa glacialis (*Linn.*), *Macgill. Man. Brit. B.* ii. p. 186 (1842).
Harelda hyemalis (*Linn.*), *Baird, Brewer, & Ridgway, Water-Birds N. Amer.* ii. p. 57 (1884).

The Long-tailed Duck is a tolerably common winter visitor to the British Islands, but is most abundant in the northern portions. It appears more or less irregularly off the south and east coasts of England, but on the west coast of Scotland and on the Hebrides is much more abundant. It visits the Orkneys and the Shetlands in winter. In Ireland, according to Sir Ralph Payne-Gallwey, it is rarely seen except in the north, and never appears in very large numbers. No instance of the breeding of this Duck in our islands has been recorded, but it has been seen in the Shetland Islands during summer.

The Long-tailed Duck is a circumpolar bird, breeding above the limit of forest-growth in the Arctic regions of both hemispheres as far north as land extends, as well as on Greenland, Iceland, Spitzbergen, and Nova Zembla. In winter it migrates southwards to the Faroes, the Baltic, and the shores of Western Europe, occasionally wandering as far south as Italy in very severe winters. It is not known to have occurred in the Black Sea, but it winters on the Caspian, Lake Baikal, in Japan, and occasionally in China. On the American continent it migrates in winter as far south as the Northern States and the Great Lakes. It has no very near ally.

The Long-tailed Duck is more arctic in its distribution than any other

Duck. The Eiders and the Scoters may breed as far north, but they are not so exclusively arctic birds. Neither in the valley of the Petchora nor in that of the Yenesay did we see anything of the Long-tailed Duck on migration, nor did we meet with it until we had travelled northwards beyond the limit of forest-growth. It is essentially a bird of the tundra, and there we found it common enough in both localities as far north as we went. Although it is almost exclusively a salt-water bird in winter, it migrates up the river for one or two hundred miles or more to breed, and appears to prefer the vicinity of fresh water, though it is found throughout the tundra from the coast to the scraggy larches on the outskirts of the forest. Probably the explanation of its almost exclusive attachment to salt water in winter is to be found in the fact that it rarely winters in a climate where all the fresh water is not frozen up. The tundra is full of lakes of all sizes, many of them connected together by small streams which rise in the flat bogs which form such an important feature in the Arctic landscape. There is no English equivalent for the Russian word tundra. To translate the Siberian tundra into Siberian barrens is only possible to a writer who has never seen this ornithological and botanical Eldorado. The margins of the lakes and rivers of the tundra are gay with many coloured mosses and lichens, and with a brilliant Arctic flora, of which the variety of species of ground-fruit form a not unimportant part; and in this district the Long-tailed Duck is the commonest species of the family. We found the smaller lakes generally inhabited by single pairs, whilst on the larger ones several pairs were often seen swimming about. There seemed to be an understanding between them that they must not invade each others' breeding-grounds; for on several occasions we witnessed severe fights, both on the wing and on the water, between these birds. We found them exceedingly tame, and were able to approach them as they swam about unconcernedly on the smaller lakes within twenty or thirty yards of us. There was seldom any occasion to take advantage of what little cover might be found; but, in spite of their boldness, they were very difficult to shoot. The moment the trigger was pulled the Duck disappeared, as if by magic, to reappear again unhurt at a safer distance. They rival the Guillemots or the Grebes in the rapidity with which they dive, the length of time they remain immersed, and the distance they can travel under water. They fly with great rapidity, their somewhat short wings moving at a great speed, and though the direction of their flight is generally straight, they turn their bodies from side to side as they slightly change their course.

The note of the Long-tailed Duck is very remarkable and often heard at their breeding-grounds, though it is said only to be uttered by the male. It is a loud, clear cry of three principal syllables, the middle one prolonged and strongly accented. It may be roughly expressed as *col-goh'-y* or

a-cow'-ie. The food of this Duck in winter is almost exclusively shell-fish and crustaceans, but in summer it feeds principally on water-plants of various kinds. Unlike many ducks, the drake does not neglect the female during the breeding-season, and takes his share in the protection and care of the young. To enable him to do this with impunity he moults very early in the season into his plain brown dress, and does not resume his nuptial plumage until the young are able to take care of themselves. When we first met with these birds in the valley of the Petchora, in the middle of June, the drakes had all lost their nuptial dress, and we had seen no signs of its resumption when we left early in August.

Many of the lakes on the tundra had some sheltered corner where a few stunted willow bushes and dwarf birches formed small patches of cover; and these were the localities where our Samoyade servant found four nests of the Long-tailed Duck, containing respectively three, five, six, and seven eggs, during the last half of June and in July. Two empty nests, containing down only, which we found further north at Dvoinik, were mere hollows in the grass, containing no other lining than down, and were both placed amongst the débris left by a recent flood, doubtless the high-water mark of the river when the ice broke up, on the shores of the inland sea where we found the nests of the Little Stint. The Long-tailed Duck sometimes breeds very late. Mr. Eagle Clarke has sent me a young bird, half feathers, half down, which he shot in Iceland on the 16th of September last year.

The down of the Long-tailed Duck is small, like that of the Teal, and equally devoid of white tips, but it is much browner; its size prevents any confusion with that of the Pintail or Mallard, though the eggs of these species resemble those of the Long-tailed Duck very closely. The eggs range in colour from pale buffish green to greenish buff, and vary in length from 2·2 to 2·0 inch, and in breadth from 1·6 to 1·45 inch.

During winter the Long-tailed Ducks frequent the sea, often at some considerable distance from the shore, but in severe weather they shelter in the quiet bays and fjords. Their food is principally obtained by diving, the birds floating shorewards with the tide, fishing as they go.

The Long-tailed Duck is about the size of the Wigeon. The adult male in nuptial dress has the head, neck, and upper breast and upper back white, suffused with grey round the eye, with a large spot of deep brown on each side of the head, which shades into brown on the sides of the neck. The back, rump, upper tail-coverts, two central tail-feathers, wings, wing-coverts, breast, axillaries, and under wing-coverts are very dark brown; the upper scapulars are very pale grey, and the lower scapulars, which are much narrowed and elongated, are white; the flanks are pale grey, but the belly, vent, under tail-coverts, and outer tail-feathers are white. Bill, basal half and nail black, remainder orange-red;

legs and feet dark slate-grey, darker on the webs; irides reddish brown. The adult female has the forehead and crown brown, a greyish-white ring round the neck, and the whole of the rest of the upper parts are dark brown, with pale-brown margins on the innermost secondaries, and pale-grey margins on the scapulars. The sides of the head are white, but the sides of the neck above the white ring are brown; the underparts are white, except the chin, upper throat, breast, axillaries, and under wing-coverts, which are brown. Young in first plumage resemble adult females, but the white parts are less white and the brown parts are paler. Young males may be distinguished by the chestnut margins of the scapulars, innermost secondaries, and wing-coverts, and the white on the back of the neck is purer and more clearly defined. Males in first nuptial dress differ from adults in having shorter central tail-feathers, in having the dark parts browner, and have ash-grey markings on the feathers of the upper back and scapulars. In males in moulting-plumage the white on the head is confined to the sides of the face, the rest of the head and neck, upper breast, upper back, and the scapulars being dark brown, the feathers of the upper back and the scapulars having broad clearly defined chestnut margins. The underparts below the breast are white, as in the nuptial plumage. Young in down are dark brown on the upper parts, and nearly white on the underparts, but the white on the throat nearly meets on the nape, and the brown below it extends in a narrow band across the breast. There is a white patch on the lores at the base of the upper mandible, and an obscure white mark round the eye.

FULIGULA NIGRA.

COMMON SCOTER.

(Plate 65.)

Anas nigra, *Briss. Orn.* vi. p. 420 (1760); *Linn. Syst. Nat.* i. p. 196 (1766); et **auctorum plurimorum**—*Gmelin, Latham, Temminck,* (*Bonaparte*), (*Dresser*), (*Saunders*), &c.
Anas cinerascens, *Bechst. Orn. Taschenb.* ii. p. 457 (1803).
Oidemia nigra (*Briss.*), *Flem. Phil. Zool.* ii. p. 260 (1822).
Melanitta nigra (*Linn.*), *Boie, Isis,* 1822, p. 564.
Platypus niger (*Linn.*), *Brehm, Lehrb. Naturg. eur. Vög.* ii. p. 820 (1824).
Anas atra, *Pall. Zoogr. Rosso-Asiat.* ii. p. 247 (1826).
Fuligula nigra (*Linn.*), *Degl. Orn. Eur.* ii. p. 470 (1849).

The Common Scoter, more frequently called the Black Scoter, is one of the best known of the Sea-Ducks that visit our islands every winter. It frequents most parts of the coast of the British Islands, including the Shetlands and the Hebrides. It is said to be rare in the south of Ireland, but in the north of that country it abounds in thousands. It has not been known to breed in England or Ireland, but occasional pairs do so in various parts of Scotland, in Sutherlandshire and Inverness-shire.

The Common Scoter is probably a circumpolar bird, though it has not been recorded from East Siberia or Greenland, and American examples are regarded as subspecifically distinct from those of the Old World under the name of *Fuligula nigra americana* *. They only differ in the colour of the bill: in both forms the centre of the upper mandible is orange; in the American form the tubercle at the base of the bill is also orange, but in the European form it is black.

The breeding-range of the European form of the Common Scoter extends from Iceland through Northern Europe and West Siberia to the Taimur peninsula. It is a more northern species than the Velvet Scoter, breeding from lat. 74° down to the Arctic circle, below which it is rarely found except at a high elevation. In winter it is only known with certainty to occur in the Baltic and on the coasts of Western Europe, occasionally straying as far south as the Azores and the Mediterranean. Pallas records it from

* The synonymy of the American form is as follows:—

Oidemia americana, *Swainson & Rich. Faun. Bor.-Amer.* ii. p. 450 (1831).
Fuligula (Oidemia) americana (*Swains.*), *Nutt. Man. Orn.* ii. p. 422 (1834).
Fuligula americana (*Swains.*), *Aud. Orn. Biogr.* v. p. 117, pl. 408 (1839).
Œdemia americana (*Swains.*), *Coues, Key N.-Amer. B.* p. 293 (1872).

the Black and Caspian Seas, but in neither of these localities has it been obtained by modern collectors. It is probable that Pallas was correct, as Bogdanow records it on migration from the valleys of the Kama and the Volga.

The American form of the Common Scoter breeds in the Kurile Islands and across Arctic America to Hudson's Bay. It winters in Japan, on the Pacific coast of North America down to Southern California, the Great Lakes, and on the Atlantic coast as far south as the Gulf of Mexico.

There are few Ducks more exclusively marine in their habits, or more uniformly gregarious, than the Common Scoter. In winter they are generally seen in very large flocks, which rarely if ever wander inland from the shore. At their breeding-grounds in the Arctic regions they seldom ascend the rivers far from the ocean; but many of them reach their summer-quarters by migrating across country, following for the most part the great river-valleys. On the tundra they are seen in pairs on the lakes as soon as they arrive, but they are so very wary that few Ducks are more difficult to shoot. Either some of them must breed very far north, or, what is more probable, few of them breed during their first spring; for large flocks are to be seen during the whole of the short summer at the mouths of the great rivers, on the banks of which other individuals are busily occupied with the duties of incubation. In the valley of the Petchora flocks of Black Scoters were seen flying north down the river long after other Ducks had eggs. In the middle of July we were lying at anchor in the lagoon of the river waiting for the disappearance of the fog which had come down from the arctic ice and concealed the Golievsky Islands, which divide the lagoon from the ocean. The sun was shining brilliantly overhead, and when the fog lifted, the island was revealed close to us, with a flock of ten thousand Black Ducks circling in a cloud over it. It seems scarcely possible that these were all males whose mates were scattered on the nests over the tundra. More probably they were the accumulation of the late flocks that we had seen migrating down the river, and which most likely consisted of the previous year's birds, not yet adult enough to breed. They appear to arrive at their summer-quarters very late, and to leave them again very early, probably before the autumn moult takes place. If this be so, it will explain the statement of Naumann that the adult males arrive in the Baltic in August, but the young not until two months later, and also that of Cecil Smith, who found them on the Devonshire coast moulting their quills and unable to fly in the middle of November.

Krüper found the Common Scoter in Iceland, breeding in small numbers on the islands in the Myvatn See or Musquito Lake, and more abundantly in the willow-scrub on the mainland. In the valley of the Petchora we never found the nest on the islands in the delta, but either near a lake on the

tundra or on the sloping river-bank, concealed amongst the dwarf birch or willow-scrub. The nest was a mere hollow scraped in the ground, lined with a few broken twigs, dead leaves, and dry grass, but containing plenty of down.

The usual note of the Common Scoter is a grating *kr, kr, kr*, like that of the Tufted Duck, but in early spring the drake calls to the duck in a double note, which is not unmusical. It is a bird of very rapid flight, especially on migration, but on the ground it walks clumsily. It swims with perfect ease, and obtains most of its food by diving; this consists of mollusks and aquatic insects, varied with the seeds of water-plants and other vegetable substances.

The Common Scoter is rather a late breeder. In North-east Russia we did not take its nest until the last week of June, and found fresh eggs in July. Krüper also remarks that in Iceland it is a late breeder, and that it did not begin to lay until the middle of June.

The eggs, usually eight, but sometimes nine in number, are pale greyish buff, considerably darker than those of the Wigeon, smooth in grain, but having little gloss. They vary in length from 2·65 to 2·4 inch, and in breadth from 1·8 to 1·75 inch. The down of the Black Scoter very closely resembles that of the Mallard, but is a trifle greyer; it is somewhat smaller than that of the Velvet Scoter, and in the latter the white centres are not quite so conspicuous. The eggs appear to be always smaller than those of the Velvet Scoter, and generally smaller than those of the Goosander; they are not always absolutely distinguishable from the latter, but in nine cases out of ten they may be identified by their weight. I have never met with blown eggs of the Common Scoter that weighed quite so much as a quarter of an ounce, and of eggs of the Velvet Scoter and Goosander I have only met with one example of each which did not weigh more than a quarter of an ounce. The eggs of the Goosander may, however, always be recognized by the paleness of the down in the nest.

The Common Scoter* is about the size of the Mallard. The adult male in nuptial dress has the entire plumage rich glossy black. Bill and tubercle at the base black, except a yellow patch round the nostrils; legs and feet brownish black, darkest on the webs; irides hazel. The changes of plumage referable to age, sex, and season are similar to those in the Velvet Scoter; but the adult female and the young of both sexes, instead of having the obscure white patches on the sides of the face, have the whole of the sides of the face, the sides of the upper neck, the chin, and upper throat brownish white obscurely streaked with brown. Young in down are unspotted dark brown on the upper parts and across the breast; throat white; belly greyish brown.

* The word "Scoter" is probably a corruption of the word "Sea-Coot."

FULIGULA FUSCA.

VELVET SCOTER.

(Plate 65.)

Anas nigra major, *Briss. Orn.* vi. p. 423 (1760).
Anas fusca, *Linn. Syst. Nat.* i. p. 196 (1766); et **auctorum plurimorum**—*Gmelin, Latham, Temminck, (Bonaparte), (Dresser), (Saunders)*, &c.
Anas fuliginosa, *Bechst. Naturg. Deutschl.* iii. p. 962 (1809).
Melanitta fusca (*Linn.*), *Boie, Isis*, 1822, p. 564.
Oidemia fusca (*Linn.*), *Flem. Phil. Zool.* ii. p. 260 (1822).
Platypus fuscus (*Linn.*), *Brehm, Lehrb. Naturg. eur. Vög.* ii. p. 822 (1824).
Anas carbo, *Pall. Zoogr. Rosso-Asiat.* ii. p. 244 (1826).
Fuligula fusca (*Linn.*), *Degl. Orn. Eur.* ii. p. 472 (1849).

The Velvet Scoter is a regular winter visitor to the British Islands, but is far less abundant than the Common Scoter. It is found in small numbers along the south and east coasts of England, more frequently on the east coast of Scotland, although only a straggler to the Shetlands, and becomes rarer on the west coast of Scotland and the adjoining islands. In Ireland it is said by Sir Ralph Payne-Gallwey to be comparatively rare, and only met with at some considerable distance out at sea. It has been thought that this bird bred in Scotland, but no absolute proof of the fact has yet been obtained.

The Velvet Scoter is a circumpolar bird, but as American examples are without the two black lines extending from the nostrils to the nail on each side of the bill, they are regarded as subspecifically distinct under the name of *Fuligula fusca velvetina**. The breeding-range of the Old-World form of the Velvet Scoter extends from the Atlantic to the Pacific. It has not been recorded from Iceland, but has been known to wander on migration as far as the Faroes and Greenland in the west and Alaska in the east. It ranges as far north as lat. 69° both in Europe and in Asia, and in moorland districts as far south as the Baltic Provinces in Europe, and to lat. 55° in South-east Siberia. It winters on the coasts of Western Europe, occasionally wandering as far south as the Mediterranean and Black Seas. It passes through Turkestan, Dauria, and Mongolia on migration to winter on the shores of the Caspian Sea and the coasts of China and Japan. The American form breeds in Arctic America and winters in the Great Lakes and on both coasts of the United States.

The Velvet Scoter is not so exclusively a marine duck as the Black

* The synonymy of the American form is as follows:—
Oidemia velvetina, *Cassin, Proc. Ac. Nat. Sci. Philad.* v. p. 126 (1850).
Melanetta velvetina (*Cass.*), *Baird, B. N. Amer.* p. 805 (1858).
Œdemia fusca, *b.* (?) velvetina (*Cass.*), *Coues, B. N.-West*, p. 582 (1874).

Scoter. Although it frequents the sea-coasts in winter, it also ascends the rivers, and occasionally visits inland lakes. It is perhaps also rather less wary, and may more readily be approached within gunshot. In the breeding-season it migrates further up country, and often makes its nest in the short willow-scrub on the tundra at some distance from water. Like its near ally it is a somewhat late breeder, eggs being seldom found before the end of June or the beginning of July. The nest is a mere depression in the ground, lined with any suitable material that may be convenient, and provided with abundance of down.

The eggs of the Velvet Scoter are usually eight, but sometimes nine, in number, and are pale greyish buff, smooth in grain, but with little gloss. They vary in length from 2·9 to 2·7 inch, and in breadth from 1·95 to 1·85 inch. The down is rather larger than that of the Black Scoter, slightly browner in colour, but the pale centres are not so distinct. The eggs of the Goosander overlap in size, but the down is always an easy means of distinction.

The food of the Velvet Scoter is almost entirely obtained by diving, and consists principally of mollusks. Its note is a harsh *ker-ker*, like that of most of the diving Ducks.

The Velvet Scoter is a larger bird than the Common Scoter. The adult male in full nuptial dress is entirely black, glossed with green and purple, except a patch behind the eye, the inner web of the first secondary, and the tips of the greater wing-coverts, which are white. Bill orange, black on the nostrils and basal tubercle, the margin of the upper mandible and a streak on each side of the nail meeting and running up to the nostrils also black; legs and feet orange, webs brownish black; irides greyish brown. The adult female has the entire plumage brown, with a slight greenish gloss on the wings, and the white alar speculum as in the male; the feathers of the back and the scapulars and those of the whole of the underparts have obscure pale edges; there are two obscure white patches on the sides of the face, one between the eye and the base of the bill, and another above the ear-coverts. Bill brown. Young in first plumage very closely resemble adult females, but young males may be distinguished by the absence of the pale margins to the feathers of the back and the scapulars, and the much greater obscurity of the two white patches on the sides of the face. Males in first nuptial dress have less metallic gloss on the plumage. Males have doubtless a brown moulting-dress, somewhat resembling that of the female; but the only evidence at present available of this is the statement of Naumann and others that adult birds in nuptial plumage occasionally have brown feathers which appear to be remains of this dress. Young in down differ from those of the Common Scoter in having a white spot on the wings, and in being whiter on the belly.

FULIGULA PERSPICILLATA.

SURF-SCOTER.

(Plate 65.)

Anas nigra major freti hudsonis, *Briss. Orn.* vi. p. 425 (1760).
Anas perspicillata, *Linn. Syst. Nat.* i. p. 201 (1766); **et auctorum plurimorum**—*Gmelin, Latham, Temminck,* (*Bonaparte*), (*Dresser*), (*Saunders*), &c.
Anas latirostris, *Bodd. Tabl. Pl. Enl.* p. 58 (1783).
Melanitta perspicillata (*Linn.*), *Boie, Isis,* 1822, p. 564.
Platypus perspicillata (*Linn.*), *Brehm, Lehrb. Naturg. eur. Vög.* ii. p. 823 (1824).
Oidemia perspicillata (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 219 (1824).
Macroramphus perspicillata (*Linn.*), *Less. Man. d'Orn.* ii. p. 414 (1828).
Fuligula (Oidemia) perspicillata (*Linn.*), *Bonap. Ann. Lyc. Nat. Hist. N. York,* ii. p. 389 (1826).
Pelionetta perspicillata (*Linn.*), *Kaup, Natürl. Syst.* p. 107 (1829).
Fuligula perspicillata (*Linn.*), *Aud. Orn. Biogr.* iv. p. 161, pl. 317 (1838).
Pelionetta trowbridgii, *Baird, B. N. Amer.* p. 806 (1858).
Œdemia perspicillata, *var.* trowbridgii (*Baird*), *Coues, Key N.-Amer. B.* p. 295 (1872).
Œdemia perspicillata trowbridgii (*Baird*), *Coues, Check-List,* 2nd ed. no. 740 (1882).

The Surf-Scoter is a rare straggler to the British Islands in winter, but has been obtained as far south as the Scilly Isles. An example of this bird was sent in the flesh to Mr. Bartlett about half a century ago (Blyth, 'Naturalist,' iii. p. 420), which may possibly have been shot in this country; but the first reliable record of this bird in our islands appears to be that made by Thompson, who states that a male was shot at Ballyholme, Belfast Bay, on the 9th of September 1846, whilst its companion was several times seen (B. of Ireland, iii. p. 118). Dunn saw a bird of this species in June 1847 in Rona's Voe, North Shetland ('Zoologist,' 1848, p. 2067); a third was obtained in Musselburgh Bay, in the Firth of Forth, in the spring of 1852 (Martin, 'Naturalist,' 1853, p. 83); Yarrell records a fourth captured near Weymouth, in Dorset, in the winter of 1851 (Hist. Brit. B. 3rd ed. iii. p. 325); and another, a female, was shot in the same locality in December 1853 (Thompson, 'Zoologist,' 1854, p. 4255). One was killed at Crofton, in Cumberland, in August 1856 (Eyton, Hist. Rar. Brit. B. p. 81); and one was shot on the rocks at Gristhorpe, near Scarborough, on the 25th of October 1860, by Mr. A. S. Bell, another bird, probably of the same species, being in its company ('Zoologist,' 1860 p. 7274). Rodd records a specimen shot by a boy in Scilly in September 1865 ('Zoologist,' 1865, p. 9794). Gray mentions two examples of this bird—one shot

in the winter of 1865 at Holm, near Stornoway, in the Hebrides, and the other at Swanbister, in Orkney, in March 1866 (B. of West of Scotland, p. 383). A second example was obtained in Scilly in October 1867 (Rodd, 'Zoologist,' 1867, p. 1017). In February 1875 a Surf-Scoter was seen in the Orkneys by Mr. T. M. Pike, who failed to secure it; and a year later that gentleman shot a male in the same locality ('Zoologist,' 1879, p. 335). Two other examples are recorded by Capt. Clark-Kennedy in 'The Field' for March 11th, 1876, one of which was obtained on Hoy Island in 1872, and the other at the entrance of Loch Stennis, Stromness ('Zoologist,' 1879, p. 337). Another was shot at Stromness on the 23rd of October 1880 (H. Langton, 'Zoologist,' 1881, p. 60). A second Irish example is recorded by Sir Ralph Payne-Gallwey, who states that it was shot in October 1880 at Clontarf, co. Dublin ('Fowler in Ireland,' p. 113); and on the 9th of December 1882 a fine female was shot in the estuary of the Ribble by Mr. R. H. Thompson ('Zoologist,' 1884, p. 29). According to Sclater the Surf-Scoter has never been kept in confinement.

The Surf-Scoter is a Nearctic species, breeding from the Pacific to the Atlantic, from lat. 70° down to about lat. 50°, and wintering on the Pacific coast as far south as Lower California, the shores of the Great Lakes, and the Atlantic coast as far south as Jamaica. It is a rare visitor to Greenland; and though it has not yet been obtained in Iceland, it has occurred accidentally on the Bermudas, the Faroes, on the coasts of Scandinavia, Heligoland, Germany, France, and in Switzerland. It has no very near ally.

The Surf-Scoter does not differ much in its habits from the Common and Velvet Scoters: like them it is a migratory bird, its true home being in the arctic regions of the American continent. It migrates from its breeding-grounds across the land as well as down the coasts, and breaks the journey on the shores of Hudson's Bay as well as on those of the great interior lakes, remaining until it is compelled to retire south as the water becomes frozen. It frequents the coast in great numbers from Nova Scotia to Carolina, arriving in September and remaining until the end of April, when it retires northwards to breed. On migration it often associates with Long-tailed Ducks and with Velvet Scoters. Until mid-winter these large flocks of Surf-Scoters gradually move southwards to warmer water as food becomes scarce, but after February they gradually retire north again. The Surf-Scoter is a very expert diver, and most of its food is obtained by this means. Its flight is strong and powerful, but it rises from the water with some difficulty. Dr. Cooper says that on the Pacific coast of North America, where it is very abundant in winter, large flocks remain behind after their companions have left for their breeding-grounds. Many of the individuals in these flocks are very old birds. Rainy seasons are frequently fatal to them; and whilst moulting they

become very thin, and in some cases blind, swimming about close to the shore or wharves, quite regardless of danger.

The food of the Surf-Scoter is composed principally of mollusks and shell-fish; but small fish have been found in its stomach, which often contains quantities of loose gravel. It is said to be a remarkably silent bird, but the female usually utters a guttural cry as she rises disturbed from her nest.

The Surf-Scoter frequents wooded country in which are scattered lakes and streams, as well as the tundras, near the Arctic Sea, for breeding-purposes. It delights to frequent the secluded banks of rivers that flow into the lakes or so often connect them by winding "porterages." It appears to be rather a late breeder. MacFarlane obtained a nest, containing eight eggs, on the Lower Anderson River on the 25th of June, and another, in which there were six eggs, on the 5th of July. One nest found by MacFarlane was built on the margin of a small lake; but another was made on a ridge of ground at the foot of a dry stunted pine-tree entirely concealed by the lower branches. Other nests have been found in similar situations. The nest is described as being very similar to that of the American form of the Velvet Scoter, which is made of moss, twigs, and various plants matted together, large and almost flat, and placed in a depression in the ground. Those found by MacFarlane appear to have been made of little else but down and a few feathers. These latter materials are added, as is the case with most Ducks, as the clutch of eggs approaches its full number. Audubon, who found the Surf-Scoter breeding in Labrador, gives some particulars of its nesting-habits. He discovered a nest in a large freshwater marsh, built in a tuft of grass, and about four inches above the surrounding ground. It was made of dead and decaying weeds, the inner cavity, which was about six inches in diameter, being surrounded with down plucked from the female. It contained five eggs. He shot the female as she rose from her nest, but no glimpse was obtained of her mate. He afterwards met with a party of male Surf-Scoters in a place about four miles distant from the marsh, so that it is very probable that the drakes desert the ducks as soon as the latter begin to sit.

The eggs of the Surf-Scoter are from five to eight in number. They are pale greyish buff when newly laid, with a slight pinkish tinge, smooth in texture, and with little gloss. The eggs obtained by MacFarlane vary in length from 2·3 to 2·25 inch, and in breadth from 1·75 to 1·6 inch; they are smaller than those of the Black Scoter and the Velvet Scoter, but otherwise closely resemble them. The down of the Surf-Scoter does not appear to have been carefully described.

The Surf-Scoter very closely resembles in its winter habits the other "Black Ducks" that swarm upon the coasts. It is not often pursued by

the sportsman, for its flesh is said to be very rank, dark, and unpalatable. To the hunters on Long Island it is known as the "Spectacled Coot" and "Surf-Coot." It is not only very gregarious, but sociable, and joins other flocks of wildfowl, especially those of Long-tailed Ducks and other Scoters. They delight in the open sea, riding on the roughest waves, light and buoyant as corks, ever and anon diving to obtain their food amongst the rocks far below the surface, or chase the tiny fish swimming in mid-water below them.

The Surf-Scoter is about the same size as the Common Scoter. The adult male in full nuptial dress has the entire plumage glossy black, with the exception of a large white patch on the crown, and a still larger one on the hind neck. Bill with the upper mandible orange-red, yellowish grey on the nail, protuberance on each side at the base black, with a bluish-white patch in front extending to the nostrils; lower mandible flesh-colour, darker on the nail; legs and feet orange-red, webs dusky; irides yellowish white. The adult female and young in first plumage are intermediate between those of the Velvet Scoter and those of the Common Scoter, the wing being without an alar speculum as in the latter, but the sides of the head having the obscure white patches as in the former. The changes of plumage which the adult male undergoes are doubtless the same as those of the allied species, but satisfactory evidence of this is much to be desired. Males of the year have the white on the crown, but the white on the nape is much less developed than in adult birds, and have the breast and belly much more mottled with brown. Young in first plumage closely resemble adult females, but have traces of white on the nape. Young in down appear to be undescribed.

Two other species belonging to this genus have been included in the list of British birds. The Ring-necked Duck (*Fuligula collaris*) was originally described by Donovan (Brit. Birds, vi. pl. cxlvii.) from an example exposed for sale in Leadenhall Market in London, in January 1801. Since that date it has been found to be an American bird, breeding in Canada and the Northern States, and wintering in the Southern States, Central America, and the West Indies. As no second example has occurred in our islands, and as it has not been recorded from Heligoland, I have not devoted an article to its history.

The Lesser Scaup (*F. affinis*) has also found its way into the British list, in consequence of a bird obtained in the London market and now in the collection of Mr. F. Bond. This example is certainly not the Lesser Scaup, but probably a hybrid between the Scaup and the Pochard. A second alleged occurrence of this species (Roberts, 'Zoologist,' 1855, p. 4631) proved on investigation to refer to a female Pochard. The Lesser Scaup is an American bird, only differing in being slightly smaller than the Common Scaup, from which it is doubtfully distinct.

Genus SOMATERIA.

The Eider Ducks were included by Linnæus and Brisson in the genus *Anas*; but in 1822 Boie, in the 'Isis' (p. 564), and Fleming, in his 'Philosophy of Zoology' (ii. p. 260), separated them under the generic title of *Somateria*, a name for which the latter writer acknowledges his indebtedness to Leach. The Eider Duck, the *Anas mollissima* of Linnæus, has been, by common consent, accepted as the type.

The Eider Ducks are excellent divers, and the hind toe is furnished with a well-developed membrane. They vary so much in the shape of the bill, that it is difficult to find any important point in which they agree among themselves and differ from their allies, except in the circumstance that some part of the head is always coloured emerald-green.

There are only five species of Eider Ducks, which are confined to the northern coasts of both hemispheres. Though they form a very small genus, they are easily recognizable by the peculiarities of their coloration. The adult males may be diagnosed as follows:—

- Steller's Duck *.
- King Eider ..... } A black stripe on each side of the throat, meeting at the chin.
- Pacific Eider .. }
- Scapulars and innermost secondaries entirely white .....
  - Eider Duck.
  - Spectacled Eider. Breast black.

Sharpe and Dresser, and Baird, Brewer, and Ridgway admit a sixth species, the American form of our Common Eider. The former writers only recognize one genus, but the latter subdivide the Eiders into three genera. With a wrong-headedness which it is not easy to understand, Baird, Brewer, and Ridgway are conservative where they ought to be revolutionary, and revolutionary where they ought to be conservative. They cling to the old-fashioned notion that the form of the bill is a structural character and of generic value, and thus complicate the science of ornithology by an unnecessary multiplication of genera, whilst in their nomenclature they adopt the new-fashioned practice of attempting to carry out

* The Pied Duck (*Fuligula labradoria*) has been included by some ornithologists in the genus *Somateria*, and is somewhat intermediate between the Long-tailed Duck and Steller's Duck, thus connecting the two genera; but, on the whole, its affinities appear to be more with the former genus.

the Utopian system of priority, which still further complicates the subject. No better instance could be adduced of the greater generic value, in some cases, of colour than of structure. The emerald-green on the head and some other peculiarities of coloration have survived great changes in the form of the bill.

The Eider Ducks fly, swim, and dive with great ease, but their short tarsi cause them to walk very badly. They are exclusively coast-birds, and almost exclusively feed upon insects, shell-fish, or other animal food. Their notes are very harsh. They breed on the ground.

SOMATERIA STELLERI.

STELLER'S EIDER.

(Plate 59.)

Anas stelleri, *Pall. Spic. Zoel.* vi. p. 35, pl. v. (1769); **et auctorum plurimorum** —*Gmelin*, (*Middendorff*), (*Baird*), (*Degland*), (*Newton*), (*Dresser*), (*Saunders*), &c.
Anas dispar, *Sparrm. Mus. Carls.* no. vii. (1786).
Anas occidua, *Bonn. Tabl. Encycl. Méth.* i. p. 130 (1790).
Clangula stelleri (*Pall.*), *Boie, Isis*, 1822, p. 564.
Fuligula dispar (*Sparrm.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 206 (1824).
Macropus stelleri (*Pall.*), *Nutt. Man. Orn.* ii. p. 451 (1834).
Polysticta stelleri (*Pall.*), *Eyton, Hist. Rar. Brit. B.* p. 79 (1836).
Stellaria dispar (*Sparrm.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 57 (1838).
Harelda stelleri (*Pall.*), *Keys. & Blas. Wirb. Eur.* p. 230 (1840).
Somateria stelleri (*Pall.*), *Jard. Brit. B.* iv. p. 73 (1843).
Eniconetta stelleri (*Pall.*), *Gray, List Gen. B.* p. 95 (1846).

Steller's Eider, the Western Duck of Pennant, who figured it from an example in the Leverian Museum obtained on the west coast of America, is the Western Pochard of Selby, and the Steller's Western Duck of Yarrell. It has very slender claims to be regarded as a British bird; but it is possible that a stray individual may occasionally wander westward from Russian Lapland as far as our shores, and two such occurrences are on record, one in 1830 and the second in 1845. The first example is said to have been shot at Caistor, near Yarmouth (Yarrell, Loudon's Mag. Nat. Hist. iv. p. 117), on the 10th of February, and is supposed to be an almost adult male, in the Norwich Museum; but there are several discrepancies in the details of its subsequent history which throw some doubt on the authenticity of the alleged occurrence. The second example was shot by Mr. George N. Curzon, at Filey Brigg, in Yorkshire, on the 15th of August (Bell, 'Zoologist,' 1846, p. 1249), and was a male assuming its nuptial dress. These records are rendered probable by the occurrence of two or more immature examples on the island of Heligoland, a locality for rare birds which is less open to doubt than any other in Europe, thanks to the genius of the veteran ornithologist who resides there.

Steller's Eider has a very limited range, being only known to breed on the shores of the Arctic Ocean in North Russia and Siberia, and on the islands in Behring Sea. It was originally described by Pallas from examples obtained by Steller, who found it breeding on the shores of

Kamtschatka. It winters in the Sea of Ochotsk, and a few, probably young birds not yet breeding, remain throughout the year on the shores of the Kurile Islands. Middendorff found it breeding on the Taimur peninsula, whence it migrates in winter, when the Arctic Ocean freezes, to the Varanger fjord, where the influence of the Gulf-stream secures open water throughout the year. Immature birds remain during the summer in this locality, and adult birds are said occasionally to remain to breed. It appears as if some individuals migrate across country to the Baltic, where it has repeatedly occurred. It has twice been recorded from Denmark, occasionally from North Germany, and once from France. It is not known to have occurred on the mainland of Alaska; but it is possible that its range extends along the American shores of the Arctic Ocean, as Mr. Kumlien says that he saw an example shot near Disco, and observed several in Cumberland Bay, in Davis Strait. These statements must, however, be accepted with some reserve, as Mr. Kumlien has not always been correct in his identifications. It has no very near ally.

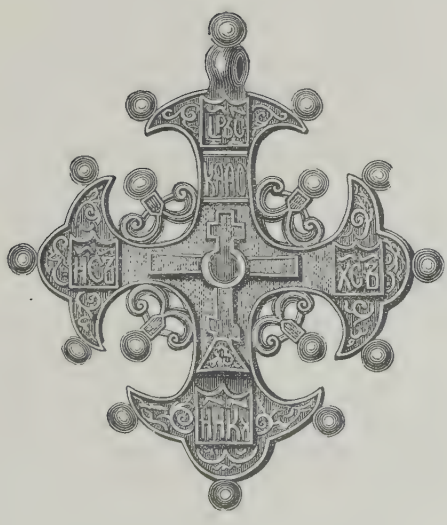
Of the habits of Steller's Eider scarcely anything is known. Middendorff found it breeding on the tundras, and obtained eggs on the 7th of July. The nests were very deep in the moss, and contained from seven to nine fresh eggs and abundance of down. The females sat very close, and rose from the nest with a cry resembling that of the Teal, but more of a rattle. The males were not far off. Except during the breeding-season, Steller's Duck is gregarious, and in the Varanger fjord flocks of non-breeding birds are seen during the summer. It is said to be a very shy bird and to forsake its nest if disturbed. It is essentially a marine duck, and is supposed to feed principally on shell-fish.

The eggs obtained by Middendorff are pale buffish green, and vary in length from 2·5 to 2·2 inch, and in breadth from 1·6 to 1·5 inch. Small eggs of Steller's Eider are indistinguishable from large eggs of the Pintail.

Steller's Duck is about the size of the Wigeon. The adult male in nuptial plumage has a black ring round the neck, glossed with green and purple, connected with the base of the under mandible by a black band, nearly interrupted by white between the throat and the fore neck, and extending on the upper parts between the scapulars down the back to the upper tail-coverts, where the brownish-black tail connects it with the black under tail-coverts and the dark brown centre of the breast and belly; a black ring round the eye, two conspicuous spots on the sides of the breast, and the outer webs of the elongated and falcated scapulars and innermost secondaries complete the glossy black of the plumage, leaving the rest white, except an emerald-green spot on the lores and a broad one on the occiput of the same colour, the buffish-chestnut breast and sides of the body, and the dark brown primaries and the purple-blue speculum. Bill dark slate-grey, paler on the nail; legs and feet greyish brown; irides

hazel. The adult female somewhat resembles the females of the allied species, but may at once be distinguished by its glossy purple-blue speculum between two white alar bars. Young in first plumage somewhat resemble adult females, but have no black on the belly.

Males in first nuptial dress have grey markings on the wing-coverts and flanks. Males in moulting-dress and young in down appear to be unknown.



SOMATERIA MOLLISSIMA.

COMMON EIDER.

(Plate 59.)

Anser lanuginosus, *Briss. Orn.* vi. p. 294 (1760); *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 37 (1816).
Anas mollissima, *Linn. Syst. Nat.* i. p. 198 (1766); et auctorum plurimorum—*Gmelin, Latham, Temminck,* (*Bonaparte*), (*Dresser*), (*Saunders*), &c.
Somateria mollissima (*Linn.*), *Boie, Isis,* 1822, p. 564.
Anas cutberti, *Pall. Zoogr. Rosso-Asiat.* ii. p. 235 (1826).
Somateria st. cuthberti (*Pall.*), *Eyton, Cat. Brit. B.* p. 58 (1836).
Somateria thulensis, *Malmgr. Kongl. Vet.-Ak. Œfv.* p. 380 (1864).

The Eider can only be regarded as a rare straggler to England south of the Humber. It appears accidentally off the low-lying eastern shores, and off those of the south and west counties of England, and is only known as a rare visitor to the Irish coasts. It breeds on the Farne Islands, very sparingly in the Firth of Forth, in the Orkneys and Shetlands, and in suitable localities throughout the islands off the west coast of Scotland, extending to those of the St.-Kilda group. In winter it wanders further from its usual haunts, and then occurs as a straggler on various parts of the southern coasts.

The Eider appears to be an Atlantic species, breeding as far east as the shores of the Kara Sea, and as far west as the Coppermine River. It breeds as far south as Labrador and Newfoundland, and on the coasts of Greenland up to lat. 81½°. It is specially abundant in Iceland, the Faroes, Spitzbergen, and Franz-Josef Land, and breeds in various suitable localities on the islands off the coast of Norway and Denmark. Wherever there is open water throughout the year it is a resident; but it migrates from localities where the sea freezes in winter, to the Baltic, the shores of the North Sea, and the English Channel. There are records of somewhat doubtful authenticity of young birds having been driven, in severe weather, as far south as Provence and the Swiss Lakes. On the American continent it is found in winter as far south as the coasts of Maine.

The Eiders breeding in Labrador and Newfoundland are said to differ slightly from those breeding further north, and may possibly be regarded as subspecifically distinct under the name of *Somateria mollisima dresseri,* but both forms are said to occur in Davis Straits and Cumberland Sound. It is not known that the females may be distinguished; but in the males of the latter form the feathers on the forehead project in a very narrow

line, and only half as far as those on the side of the bill, whilst in examples belonging to the typical form they project on the forehead almost as far as at the sides of the bill.

In the Pacific the Eider is represented by a very close ally, *Somateria v-nigrum*. It is a slightly larger bird, but scarcely differs in colour except that it possesses the black V-shaped mark on the throat which is also found in the King Eider. Its breeding-range extends from the shores of Eastern Siberia across Behring Straits, as far east as the mouth of the Mackenzie River. It winters in Behring Sea.

No bird is more maritime in its habits than the Eider. It rarely, if ever, leaves the sea, and seldom flies over the land, always preferring to follow the coast-line rather than cross even a narrow headland. It is a bird which seems very little affected by cold, and so long as the water is open it remains in its usual haunts. When driven southwards by prolonged frosts it does not go far, only to the nearest open water, and returns to its old haunts as soon as the thaw commences. It is therefore practically a resident, and may be seen on the sea, or on the islands where it breeds, all the year round. It loves to frequent precipitous islands and small uninhabited sea-girt rocks, breeding on them and obtaining its food in the surrounding sea. It is more or less gregarious at all times, but collects into much larger flocks in winter than in summer. Sometimes it is met with at a considerable distance from land, and when undergoing its annual change of quill-feathers it usually keeps well out at sea, as if fully aware of its helplessness and danger. It is a day-feeder, and appears to spend the night on the land. It is one of the earliest birds astir in the morning, going down to the sea to feed at the first streak of dawn. In winter the Eider is remarkably shy and wary; but in the breeding-season, especially when the eggs are highly incubated, the female is often very tame, sometimes allowing herself to be touched by the hand as she sits on her nest. The male, however, is at all times very vigilant, and it is only by the most careful stalking that he can be approached within gunshot. The Eider is an expert diver, obtaining most of its food in this manner, often remaining for a considerable time below the surface. It is also very fond of feeding close in-shore, swimming just outside the breakers, often diving through the waves as they turn over, and searching for the small crustaceans and other creatures on which it feeds. It does not often associate with other species, except with its close ally the King Eider. It swims quickly, often eluding danger by this means, and rides buoyant as a foam-fleck on the roughest waves. Its flight is moderately quick and powerful, and it rises from the water with less effort than many other Ducks.

It is not known that the Eider ever takes any vegetable food. It lives almost exclusively on small crustaceans, marine insects, and shell-fish.

Crabs, often of considerable size, are swallowed whole; Saxby mentions having found in the stomach of one of these birds a crab measuring two inches across the shell. The young, even in their downy plumage, are fed upon similar food to that taken by adults.

The note of the Eider is a harsh grating *kr, kr, kr*; but when courting his mate, the male utters a harsh loud cooing sound, like *ah-oo,* as he swims round and round her, and repeatedly moves his head up and down.

About the middle of March the flocks of Eiders that have lived in company during the winter break up, and the birds pair, although the business of nest-building is not commenced for nearly two months afterwards. The favourite nesting-places of the Eider are small uninhabited islands, those which are flat and well covered with herbage being preferred. Sometimes the nest is made on the summit of the rocks, perhaps two hundred feet above the sea; more often it is built on or amongst old ruins, as, for instance, at the Farnes; and less frequently it lays its eggs on the heath-covered slopes near the sea, occasionally at some distance from the water. At the Farnes most of the Eider ducks make their nests amongst the bladder campion, which grows in great profusion on some of the islands; but many birds seek nesting-sites in the clefts of the rock close to the water. In the British Islands and on the Norwegian coast fresh eggs may be obtained from the middle of May to the middle of July, the time being so protracted because the bird is rarely allowed to sit on her first clutch; but further north they are not laid until the end of June. In localities where it is not very abundant the Eider does not breed in colonies, but nests are found here and there in the most suitable places. Where the bird is common, especially where it is protected for commercial purposes, great numbers of nests are placed almost side by side; and in some cases two females share the same abode, sitting amicably on their eggs. The nest of the Eider is often a rather substantial structure made of dry grass, heather, bits of seaweed, and stalks of campion and other marine herbage. The lining of down is gradually added when the full complement of eggs is almost completed. Nests that I examined on the Farne Islands were made principally of dead and living stalks of the sea-campion and a little grass, lined with the down from the female. Sometimes the nest is very slight, being little more than a hollow in the ground or amongst the rocks, lined with a profusion of down and a few feathers.

The eggs of the Common Eider are from five to eight in number, and vary in colour from creamy grey to greyish green. They vary in length from 3·3 to 2·8 inch, and in breadth from 2·05 to 1·9 inch. The down varies from greyish brown to brownish grey, with obscure pale centres. The eggs of the King Eider may readily be distinguished by their smaller size.

The male Eider is rarely if ever seen near the nest, but may generally be observed at no great distance, either standing on the rocks or swimming in company with several other drakes in the sheltered creeks or on the open sea. Incubation lasts about a month, and during that time the drake never ventures to approach the nest, but swims about in company with other drakes whose mates are also nesting in the neighbourhood; and when the female covers up her eggs and leaves the nest to feed, he is ever on the watch to join her, and the pair may be seen swimming side by side until the female returns to the nest. Whenever she takes flight he is careful to accompany her, and follows rather than leads her from one feeding-ground to another. This attendance on the female becomes less and less assiduous until he begins to moult, generally about the time that the eggs are hatched, when he apparently considers his duties to be at an end, and deserts his mate and young for a month or more, during which he assumes a dress resembling that of the duck, for the purpose of rendering himself less conspicuous during the important process of moulting his quill- and tail-feathers, when he is unable to fly.

The young, as soon as possible after they are hatched, are conveyed to the water by their mother. It is probable that in some cases, where the nests are at a high elevation or at some distance from the water, the mother carries her ducklings to the sea in her bill, although the act has never been witnessed by any trustworthy observer. The young birds have many enemies. The large Gulls endeavour to carry them off, but are often driven away by the anxious duck; and in some localities the otter captures many of them. When alarmed, the little creatures start boldly out to sea, alternately swimming and diving. When fatigued, the old Eider often takes them on her back by sinking herself low in the water. The Eider only rears one brood in the year, but to do this it is often compelled to lay several clutches of eggs.

In winter the Eider congregates into flocks, but many pairs live by themselves. In our islands the flocks consist of from eight to twenty birds; but in countries where this species is more abundant they are frequently very large. When once they find a spot suited to their habits, they usually remain for a considerable time. These flocks of Eiders keep much to themselves, rarely joining other ducks, and are approached with difficulty. Although so conspicuous on a calm sea, the male Eider is one of the most difficult birds to see, even at a short distance, if the water be at all rough. The flesh of the Eider is by no means unpalatable, though rather dark.

Eider-down is a highly prized article of commerce, and in some places, especially in Norway, Iceland, and Greenland, the birds are strictly protected for the profit they yield. By judiciously removing the eggs and down from the nests the birds are made to lay again, and furnish a fresh

supply of the precious down. Each duck yields about four ounces of down, which, when cleaned, is worth about a sovereign a pound. The Eider soon becomes reconciled to captivity, and will then readily partake of grain and other vegetable food.

The Common Eider is considerably larger than the Mallard. The adult male in nuptial dress is a remarkably handsome bird. The forehead and crown are black, with a white line on the hind crown; the nape is emerald-green, divided by a white line from a green patch on each side of the neck. The rest of the head, the neck, mantle, elongated and falcated innermost secondaries, lesser and median wing-coverts and scapulars, a conspicuous patch on each side of the rump, are white, slightly suffused with yellow on the scapulars and innermost secondaries, and shading into rich buff on the upper breast. The lower back, rump, upper tail-coverts, primary-coverts, greater wing-coverts, secondaries, lower breast, belly, flanks, and under tail-coverts are deep black. The primaries and tail-feathers are dark brown. Bill olive-green, paler on the nail; legs and feet pale olive-green; irides hazel. The adult female is chestnut-brown, streaked on the head and neck, and barred on the rest of the small feathers, with nearly black. Quills and tail-feathers dark brown; greater wing-coverts and central secondaries with white tips. Young in first plumage closely resemble adult females, but the two white alar bars are very indistinct, and the margins of all the feathers are grey instead of chestnut. Males may be distinguished from females by the nearly black sides of their heads. Males in first nuptial dress may be distinguished by the remains of greyish-brown feathers on both the white and black parts. Males in moulting-dress closely resemble males in first plumage, but generally have some white and black feathers of the nuptial dress remaining. Young in down have the upper parts dark brown, and the underparts, as well as a broad streak over each eye, pale brown.

SOMATERIA SPECTABILIS.

KING EIDER.

(Plate 59.)

Anas freti hudsonis, *Briss. Orn.* vi. p. 366 (1760).
Anas spectabilis, *Linn. Syst. Nat.* i. p. 195 (1766); **et auctorum plurimorum—** *Gmelin, Latham, Temminck,* (*Bonaparte*), (*Dresser*), (*Saunders*), &c.
Anas beringii, *Gmel. Syst. Nat.* i. p. 508 (1788).
Somateria spectabilis (*Linn.*), *Boie, Isis,* 1822, p. 564.
Platypus spectabilis (*Linn.*), *Brehm, Lehr. Naturg. eur. Vög.* ii. p. 816 (1824).
Fuligula spectabilis (*Linn.*), *Bonap. Ann. Lyc. Nat. Hist. N. York,* ii. p. 389 (1826).
Anas superba, *Leach, fide Baird, Brewer, & Ridgway, Water-B. N. Amer.* ii. p. 83 (1884).

Although it is probable that the King Eider breeds on one or two islands off the British coast, in the absence of conclusive evidence that such is the case, it can only be regarded as a rare and accidental straggler to our shores. Examples have been obtained in various places on the east coasts of England and Scotland and in the Orkneys and Shetlands. It has been seen in pairs at the Farne Islands in summer; and Dixon observed it near St. Kilda, but failed to obtain specimens. In Ireland it is equally rare, Thompson only recording four instances of its occurrence.

The King Eider is a much rarer bird than the Common Eider or its American ally, but is circumpolar in its range, breeding even further north, probably as far as land extends. It probably breeds throughout the coasts of Greenland, Spitzbergen, Franz-Josef Land, and Nova Zembla, and on the islands off the north coast of Siberia, but appears to be only an accidental straggler to Iceland, the Faroes, and the Scandinavian coast. It has occasionally occurred on the coasts of Denmark and France. On the American continent it breeds throughout the coasts of the Arctic Ocean, occasionally straying in winter to Labrador, New Jersey, the Great Lakes, and California. In all parts of its breeding-range where open water is to be found throughout the year the adult birds are resident, but the young wander southwards in winter. It has no very near ally.

In its habits the King Eider very closely resembles the Common Eider, but, unlike that bird, it appears sometimes to frequent fresh water, and is occasionally found in small flocks on the Great Lakes of North America. So long as it can find open water it rarely wanders far from its accustomed haunts in the Arctic Regions. When driven away by frost it only retires southwards as far as is absolutely necessary, and always returns as soon as the water is open again. Young birds, however, frequently wander far from home, and it is these that are usually captured in the south.

Ross states that large flocks of males, and others consisting of females with their young, were often met with far in the Atlantic; and the Alaska seal-hunters occasionally meet with them at sea. It dives very expertly, especially when eluding an enemy during the time of its annual change of quill-feathers. Its food consists chiefly of mollusks and crustaceans, but doubtless shell-fish are also eaten. Hart, one of the naturalists attached to the last British Arctic Expedition, found shrimps in the stomachs of this bird. It never appears to eat vegetables of any kind. The note of the King Eider is said to have much resemblance to that of the common species.

Dixon when at St. Kilda had an opportunity of studying the habits of this bird. He writes, "I first became aware of the fact that the King Eider frequented St. Kilda when trying to shoot the Common Eiders swimming in the Bay. On one occasion I lay concealed for two hours watching the little party of ducks swimming just outside the breakers. Two of the pairs were King Eiders. They were not more than seventy yards away from me several times, so that I had an opportunity of carefully observing them through a powerful glass. They mingled freely with the Common Eider, and did not differ in any perceptible manner in their habits. It was a pretty sight to watch these rare and charming birds sporting in the heaving waves, the males and females swimming side by side. As the mighty rollers broke upon the shore the birds dived through the bright green wave just before it turned over. They were busy feeding on the small animals which were disturbed by the breaking waves. They floated light as corks on the heaving sea, now high up exposed to view, then deep down in the trough of the waves. As soon as they caught a glimpse of me they swam further from shore with great speed, although without seeming to exert themselves. I observed them day by day in one particular part of Village Bay where the shore was sandy and the sea full of surf. The flight of this bird is very similar to that of the Common Eider, and taken close to the surface of the water."

In its mode of nesting the King Eider closely resembles the Common Eider. Middendorff says that he met with this bird on migration on the Boganida on the 18th of June. Ten days later the first pairs were seen on the Taimur, in lat 74°, and soon afterwards large flocks appeared. He found a nest containing fresh eggs on the 7th of July; and early in August he saw many females swimming down the river with their young broods. Captain Feilden found it common at Floeberg Beach in lat. 82½°; they arrived in flocks at the end of June, most of which were killed by the hunters, but the survivors began to nest in suitable localities on the coast, and fresh eggs were obtained from the 9th to the middle of July. MacFarlane found the King Eider breeding on the Arctic coast near Franklin Bay, and he describes the nest as a mere depression in the ground fifty

yards from the beach, lined only with down. The King Eider nests on the coast of the mainland as well as on the islands in the Arctic Seas. The eggs of the King Eider are usually six in number, and vary much less in colour than those of the Common Eider, being pale greenish grey. They vary in length from 2·6 to 2·45 inch, and in breadth from 1·85 to 1·7 inch. They can very easily be confused with those of the Red-breasted Merganser, but may be detected by their greener colour. The down of the King Eider very closely resembles that of the Common Eider.

In winter the King Eider assembles in large flocks or small parties, according to its abundance in the district. They do not wander far, not being at all inconvenienced by the intense cold, and only leaving their high northern retreat when the water becomes frozen. During the cruise of the 'Corwin' in the Arctic Ocean King Eiders were seen near Wrangel Island sitting on the ice and gazing stupidly at the vessel, allowing it to approach them within fifty or sixty yards, when they splashed off into the water and took wing. Unlike the Common Eider this bird not unfrequently flies over the land, and often takes a short cut from one part of the sea to another. In North-eastern Siberia the natives kill large numbers with slings as they fly in flocks over a narrow strip of land.

The King Eider is a smaller bird than the Common Eider. The adult male in nuptial dress has the same general distribution of colour as in the commoner species, but differs from it in the following important respects:—The base of the upper mandible is spread out into a shield on each side, separated on the forehead by a line of black feathers, which are continued to the gape; there is a black V-shaped mark on the upper throat pointing towards the chin; an emerald-green mark extends from the lores under the eye and above the ear-coverts; the crown and nape are pale bluish grey; the scapulars and innermost secondaries are black; the bill and feet are orange, and the irides are yellow. The adult female resembles that of the commoner species, but the feathers on the forehead project beyond those on the side of the bill instead of extending little more than half as far. Young in first plumage may easily be distinguished from those of the allied species by the difference of the feathering at the base of the upper mandible: males differ from females in having traces of the dark lines on the throat and margin of the bill. Males in first nuptial dress have a very small shield, and only a few of the wing-coverts are white. Males in moulting-dress closely resemble males in first plumage, but may always be distinguished by their bills. Young in down resemble those of the Common Eider, but may always be distinguished by the down on the forehead projecting beyond that on the sides of the bill.

Genus MERGUS.

The Mergansers were included in the tenth edition of the 'Systema Naturæ' of Linnæus (1758, i. p. 129), as well as in the twelfth edition of that work (1766, i. p. 207), in the genus *Mergus*. In 1760 Brisson, in his 'Ornithologia,' committed the unpardonable blunder of transferring the name of *Mergus* from the Mergansers to the Divers, adopting for the former the generic term of *Merganser*. Fortunately for the interests of science Brisson found few imitators, and no one now dreams of associating the name of *Mergus* with the Divers. The Goosander, the *Merganser merganser* of Brisson and the *Mergus merganser* of Linnæus, is the type.

The Mergansers may easily be recognized by their narrow bills, furnished on both mandibles with teeth-like lamellæ. In all other respects they are Ducks.

In the changes of their plumage they resemble the species of the genus *Anas*.

In addition to the three Arctic and semi-Arctic Mergansers which belong to the list of British birds, a tropical species is a resident in Brazil.

The Mergansers fly, swim, and dive very well, but walk badly. Their haunts are both inland and on the shore; they live principally on fish, but do not refuse lower forms of animal life. Their notes are loud and harsh. They not only nest on the ground, but frequently in hollow trees.

MERGUS MERGANSER.

GOOSANDER.

(Plate 67.)

Merganser merganser, Merganser cinereus, *Briss. Orn.* vi. pp. 231, 255 (1760).
Mergus merganser, *Linn. Syst. Nat.* i. p. 208 (1766); **et auctorum plurimorum—** *Temminck, Naumann, Dresser, Saunders,* &c.
Mergus castor, *Linn. Syst. Nat.* i. p. 209 (1766).
Mergus gulo, *Scop. Ann. I. Hist. Nat.* p. 69 (1768).
Mergus rubricapillus, *Gmel. Syst. Nat.* i. p. 545 (1788).
Merganser raii, Merganser gulo (*Scop.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 36 (1816).
Merganser castor (*Linn.*), *Bonap. Comp. List B. Eur. & N. Amer.* p. 59 (1838).
Mergus orientalis, *Gould, Proc. Zool. Soc.* 1845, p. 1.
Mergus squamatus, *Gould, Proc. Zool. Soc.* 1864, p. 184.

The Goosander is a tolerably common winter visitor to the British Islands, being found in most suitable localities both on the coast as well as inland. It appears to be rarer in Ireland; but Sir Ralph Payne-Gallwey states that in the severe January of 1881 this bird was shot in every part of Ireland, and was more plentiful than had ever been known before. In the western districts of Scotland it is very abundant, even more so than the Red-breasted Merganser, and frequents all the islands of that wild coast. It appears more abundantly off the English coasts in severe seasons than in mild ones, but is always rarer in the southern districts. An occasional pair remain and breed in the Highlands. Harvie-Brown has had the eggs and down sent to him from North Perthshire, obtained in a hollow tree; and other evidence not quite so conclusive is to be found in Booth's 'Rough Notes' and elsewhere.

The Goosander is a circumpolar bird; but American examples appear to have become slightly differentiated, and are regarded by Baird, Brewer, and Ridgway as subspecifically distinct from those of the Old World under the name of *Mergus merganser americanus**. The difference is very slight, and appears to be confined to the existence in the American form of a narrow black bar across the greater wing-coverts. In both forms the basal portion of these feathers is black; but in the Old-World form the median wing-

* The synonymy of the American form is as follows:—
Mergus americanus, *Cass. Proc. Ac. Nat. Sci. Philad.* 1853, p. 187.
Mergus castor, *a.* americanus, *Cass., Bonap. Compt. Rend.* xliii. p. 652 (1856).
Mergus merganser americanus, *Cass., Ridgw. Proc. U.S. Nat. Mus.* iii. p. 205 (1880).

coverts extend beyond, and entirely hide, the black bases, whilst in the American form they fall short of them, and thus leave the narrow black bar alluded to. The New-World form breeds across North America from about lat. 42° up to the limit of forest-growth, and in winter is met with in most parts of the United States. It has also occurred in the Bermudas.

The typical form of the Goosander is a resident in Iceland, but is only an accidental straggler to the Faroes. It breeds throughout Scandinavia, but is only a summer visitor north of the Arctic circle. Further to the east it is a summer visitor to Pomerania, and across Russia and Siberia as far north as the Arctic circle, and as far south as lat. 50°. South of this line it finds a similar climate on the mountains of Turkestan and in the Himalayas, where it breeds at an elevation of ten thousand feet. It winters in Central and Southern Europe, very rarely in North-west Africa, and in Turkestan, Mongolia, China, and Japan. The Himalayan birds descend into the valleys in winter, but do not migrate as far as Central or Southern India.

The backward position of the legs of the Goosander makes it look something like a Cormorant on the ground, and causes it to walk clumsily, but enables it to dive with facility and swim with ease, whilst its long wings give it great power of flight. It is said that it can remain for two minutes under water, and sometimes reappears at a distance of fifty paces from the place where it plunged below the surface. It feeds almost entirely on fish, which its serrated jaws enable it to grasp with certainty, and it has been known to capture examples nearly six inches long. Water-insects and mollusks, and sometimes the remains of aquatic vegetation, are also found in its stomach. The Goosander is less of a marine Duck than most of the Diving Ducks, and appears to prefer rivers and small lakes to the sea-coast. It resembles the Diving Ducks in having a harsh note, not unlike the syllables *karr-karr*. The Goosander loves wild country, a combination of forest, swamp, river, and rock, such as is usually to be found near the Arctic circle or near the northern limit of the pine-regions of lofty mountain-ranges further south.

The pale grey down of the Goosander points it out at once as one of the few species of Ducks which breed in holes, those which breed in the open having always dark down. The favourite nesting-place of the Goosander is in a hollow tree-trunk; but in localities where such sites are not plentiful it shows considerable fertility of resource and capability of adaptation to circumstances in choosing the best substitute. On these occasions, however, it often displays more wit than wisdom. As the House-Martin has discovered that under the eaves of a roof a better shelter for its nest is to be found than under an overhanging cliff, so the Goosander immediately avails itself of the wooden boxes which the Finns fasten up in the trees to tempt them. These boxes, or "holkar," are made with a trap-door behind,

so that the peasant may daily rob the nest, and thus make the too-confiding bird lay a score or more eggs before the wary man thinks it prudent to cease his depredations, and allow the Goosander to sit upon the rest for fear of spoiling his next year's harvest. If these boxes be not provided, and no hollow trees are available, the Goosander finds a hole under a rock or a cleft in the cliff, and has been known to utilize the old nest of a crow or bird of prey in a tree or the top of a pollard willow. The accounts of nests on the ground given by Dresser and Wheelwright lack precision, and may after all refer to nests built on the ground, indeed, but under an overhanging rock.

The Goosander is an early breeder: in Denmark Mr. Benzon says that the eggs are laid late in April or early in May; and even in Finland Palmén states that they are laid from the middle of May to the middle of June.

The eggs of the Goosander are from eight to twelve in number, and are creamy white in colour, somewhat smooth in grain, and rather glossy. They vary in length from 2·9 to 2·5 inch, and in breadth from 1·9 to 1·8 inch. The down is a nearly uniform greyish white, which prevents any confusion between the eggs of the Goosander and those of the Velvet and Black Scoters. Large eggs closely resemble those of the former, and small eggs those of the latter, but are slightly yellower.

When the Goosander breeds at a distance from the ground, the female removes the young one by one in her beak soon after they are hatched, and leads them to the nearest water, where, being to the manor born, they swim and dive, attaining such great facility with so little practice that their knowledge seems more to be inherited than acquired.

The Goosander is as large as, sometimes rather larger than, the Mallard. The adult male in nuptial dress has the entire head and neck glossy black with green and purple reflections, the feathers of the crown and nape being slightly elongated. The lower neck and the whole of the rest of the underparts are white, suffused with rose-colour on the breast and belly, slightly vermiculated with grey on the feathers round the thighs, and having one or two brown feathers amongst the under wing-coverts. The mantle and innermost and longest scapulars are glossy black; the lower back, rump, upper tail-coverts, and tail are slate-grey with dark shaft-lines; the sides of the rump are white vermiculated with grey. The primaries, primary-coverts, and feathers on the shoulder are dark brown; the greater wing-coverts are white with concealed black bases, and the secondaries and the rest of the wing-coverts are white, the innermost secondaries with narrow black margins. Bill vermilion, black at the tip; legs and feet orange; irides red.

The female is slightly smaller (length of wing an inch less). The head and upper neck are chestnut, except the chin and upper throat, which are

nearly white, and the feathers of the crown and nape are elongated to a conspicuous crest. The rest of the upper parts are slate-grey, obscurely streaked with brown, especially on the back, and barred with pale grey on the sides of the breast and rump. The central secondaries are white, and the greater wing-coverts are broadly tipped with white. The underparts below the centre of the throat are white, marked with slate-grey on the lower throat, upper breast, and flanks. Young in first plumage closely resemble adult females, but have shorter crests and have brown instead of grey markings on the breast and flanks. Males may be distinguished by paler feathers on the median wing-coverts and outer scapulars, and darker feathers on the inner scapulars. Males in first nuptial dress have more grey on the shoulders than adults. Males in moulting-plumage closely resemble adult females, but have traces of a black ring round the neck, are darker on the back and shoulders, and show the whitish wing of the immature bird. It is not known that young in down differ from those of the Red-breasted Merganser.

MERGUS SERRATOR.

RED-BREASTED MERGANSER.

(Plate 67.)

Merganser cristatus, *Briss. Orn.* vi. p. 237 (1760).
Mergus serrator, *Linn. Syst. Nat.* i. p. 208 (1766); **et auctorum plurimorum**—*Gmelin, Latham, Temminck, Dresser, Saunders*, &c.
Mergus niger, Mergus leucomelas, } *Gmel. Syst. Nat.* i. p. 546 (1788).
Merganser serrata (*Linn.*), *Steph. Shaw's Gen. Zool.* xii. pt. ii. p. 165 (1817).

The Red-breasted Merganser is only a winter visitor to England, where it is generally distributed, both inland and on the coast; but in Scotland north of the Clyde it is a resident, breeding on the lakes both on the mainland and the adjoining islands, including the Orkneys and Shetlands, the Outer Hebrides and St. Kilda. In Ireland this bird is generally distributed both on the coast and on the inland lakes; it is most common in winter, but many remain to breed, especially in the west.

The Red-breasted Merganser is a circumpolar bird, having almost precisely the same distribution as its congener the Goosander, but it is not known to breed in Turkestan or the Himalayas. Its breeding-range extends from about lat. 50° to the Arctic circle, but in Scandinavia it reaches to the North Cape. It winters in Central and Southern Europe, and occasionally wanders as far as the north coast of Africa, but is a common migrant to the Black and Caspian Seas, China, and Japan. A single example is said to have been obtained in Kurrachee Harbour in India. On the American continent it breeds from about lat. 45° to the Arctic circle, but its alleged occurrence in Greenland as far north as lat. 73° requires confirmation. It winters in suitable localities throughout the United States. It is not known that American examples differ in any respect from those of the Old World. It has no very near ally.

The Red-breasted Merganser loves to frequent rocky coasts where there are plenty of quiet bays into which the mountain streamlets fall. The west and north coasts of Scotland, with their innumerable lochs and islands, are a perfect paradise for the Red-breasted Merganser, and nowhere can its habits be more easily or better studied. In winter it is gregarious, living in flocks of varying size; but as spring approaches, these companies gradually dwindle away, and by the end of March the breeding birds have generally separated into pairs. Each pair takes up its residence on some quiet part of the coast, in a loch or in the neighbourhood of a secluded islet. From this time until incubation commences the duck and

drake keep close company, swimming side by side up the rocky shores or flying together swiftly over the surface of the water. It is a pretty sight to see a pair of these beautiful birds daintily paddling in the bright clear water, exploring the large half-submerged rocks, now swimming close in-shore, then diving and reappearing at some distance from the land. The drake often toys with or chases his mate; sometimes they dive, apparently for amusement, turning the still water into bubbles and foam. Often the male bird sits quietly on the water under the lee of a projecting rock, his bright plumage contrasting vividly with the deep brown of the seaweed and the blue of the surrounding sea. They are remarkably wary birds; and either swim quickly out from shore when menaced by danger, or dive at once, and reappear at some considerable distance. More rarely they rise into the air and on rapid wing soon reach a place of safety.

The Red-breasted Merganser obtains most of its food from the water. When feeding in shallow water it keeps the head almost constantly submerged, poking its bill amongst the seaweed growing over the rocks. It is a remarkably expert diver, and often remains under water for a considerable time. It dives in a very similar manner to the Shag, raising its body and plunging head downwards into the water. It uses its wings as well as its feet in its progress under the water. If it sees a fish at the bottom it suddenly darts down and secures it, and at once brings it to the surface. Fish are always brought up to be swallowed as soon as they are captured; and after eating them the bird raises itself partly out of the water, flaps its wings, and usually drinks. After heavy rains it often explores the mouths of the trout-streams to prey upon the small fish that have been carried down by the torrent. In stormy weather in summer it seeks shelter in some secluded creek or inlet. In these places numbers of birds congregate, but as soon as the storm is over they disperse again. The flight of the Red-breasted Merganser is quick and powerful, the wings being moved very rapidly, and making a distinct whistling noise. The bird does not usually fly very high, as a rule just above the surface of the water; but if seriously alarmed it sometimes mounts up into the air for a considerable distance. It usually rises from the water with a considerable splash, beating the surface with its feet and wings; but it is capable of flying up direct either from the sea or the land. It swims very gracefully, but sits rather low in the water.

The food of the Red-breasted Merganser is composed of small fish, crustaceans, mollusks, and probably shell-fish; but it does not appear ever to eat any vegetable matter. Gray noticed that a bird he shot had been feeding on small black eels. The note of the Red-breasted Merganser is very similar to that of the Goosander.

In Scotland the breeding-season commences in May, the eggs usually being laid from the middle of that month till the middle or end of June;

but in more northern localities it is somewhat later, the first eggs not being laid until the end of June. In Scandinavia it breeds much further from the sea than in Scotland, choosing localities well surrounded with trees. It always likes to make its nest on an island, wherever it is possible, and only breeds on the mainland in secluded districts. It prefers to make its nest under shelter of some kind, sometimes under a large rock. Saxby says that it uses rabbit-burrows and the crevices in walls; he also states that a favourite situation is in a hollow at the foot of a dry bank where the herbage overhangs and completely conceals it. Sometimes the nest is made amongst long grass or heath, and in most cases is very slight, usually a small hollow in the ground, lined with green and dry grass, sprays of heather, and dead leaves. As the clutch of eggs is completed the female lines her nest with down plucked from her body. In some cases no nest is formed, the down being the only bed, so that the first two or three eggs that are laid rest on the cold ground. Although it does not breed in colonies, numbers of the nests of this bird may be found rather close together. Two or three are often built on one small island. Perhaps the scarcity of suitable sites, rather than any sociable instinct, is the cause.

The eggs of the Red-breasted Merganser are usually from six to nine in number, but occasionally as many as twelve are laid. They are of a more or less olive-grey colour, sometimes as dark as a pale egg of the Pheasant, but never quite reaching the cream-colour of the eggs of the Goosander, are somewhat smooth in grain, rather glossy, and they vary in length from 2·8 to 2·4 inch, and in breadth from 1·85 to 1·6 inch. The down is about the same size as that of the Mallard, but is pale brownish grey, with obscure pale tips and somewhat indistinct pale centres. The pale colour of the down prevents any confusion between these eggs and those of the Pochard and the Scaup, although the former are generally smaller and greener, whilst the latter, though not differing much in size, are usually darker.

The Red-breasted Merganser sits very closely, often allowing herself to be nearly trod on ere she leaves her eggs. Only one brood is reared in the year, but if the first eggs are removed others are usually laid to replace them. Very shortly after the young are hatched the female leads them to the water, where they swim and dive with great dexterity. The drake takes no share in family duties: like most of the other Ducks, as soon as the female begins to sit he evinces very little anxiety for her or the nest. In winter Red-breasted Mergansers gather into flocks and continue gregarious until spring.

My friend the late Mr. Charles Doncaster found seven nests, containing respectively two, six, seven, seven, eight, nine, and twelve eggs, on a couple of islands on the Inverness coast. Some of the nests were in the long

grass, whilst others were under the shelter of overhanging rocks. They were lined with dry grass, and all, except the one containing two eggs, were plentifully lined with down. The birds sat so close that he caught two of them upon their eggs.

The Red-breasted Merganser is a slightly smaller bird than the Goosander. The adult male in nuptial plumage has the entire head and upper neck glossy black with green and purple reflections, and the feathers of the crown and nape are elongated into a very conspicuous crest. A white collar, divided by a black line down the back of the neck, is abruptly defined from the lower neck and upper breast, which are buff streaked with black. The rest of the underparts are white, vermiculated with black on the flanks, but some of the under wing-coverts are brown. A peculiar patch of feathers on the sides of the breast are white, margined with black; the mantle, innermost and longest scapulars are black; the lower back and rump are white, vermiculated with black; the upper tail-coverts and tail are nearly uniform brown; the outermost scapulars are white; the lesser wing-coverts and shorter innermost secondaries are brown; the median and greater wing-coverts are white, tipped with black, forming two black bars across the wing; the primaries and the first few secondaries are brown, the middle secondaries are white, and the innermost secondaries are white with narrow black margins. Bill vermilion, black at the tip; legs and feet orange; irides red. Adult females and young in first plumage so closely resemble birds in similar plumage of the Goosander that they can only be distinguished by their smaller size; they measure in length of wing $8\frac{1}{4}$ to 9 inches instead of $9\frac{1}{2}$ to $10\frac{1}{4}$ inches. Males in first nuptial dress have brown lower backs, and the white on the sides and back of the neck is streaked with brown. Males in moulting-dress closely resemble males in first plumage, but have the dark markings on the breast and flanks slate-grey instead of brown. Young in down are dark brown on the upper parts, shading into reddish brown on the head, and into chestnut on the sides of the neck; there is a patch of white on each wing, one on each side of the upper back, and one on each side of the rump. The underparts are pure white, and the lores are white, margined above and below with dark brown.

MERGUS CUCULLATUS.

HOODED MERGANSER.

(Plate 67.)

Merganser virginianus cristatus, *Briss. Orn.* vi. p. 258 (1760).
Mergus cucullatus, *Linn. Syst. Nat.* i. p. 207 (1766); **et auctorum plurimorum**—*Nuttall, Audubon, Swainson, (Baird, Brewer, & Ridgway)*, &c.
Lophodytes cucullatus (*Linn.*), *Reichenbach, Syst. Av.* p. ix (1852).

The earliest known British example of the Hooded Merganser was a young female killed at Yarmouth in the winter of 1829 (Selby, Ill. Brit. Orn. ii. p. 383). A second immature example was killed in the Menai Straits, in the winter of 1830–31 (Eyton, Hist. Rarer Brit. B. p. 75). Yarrell adds two alleged occurrences on unsatisfactory evidence which it is not necessary to quote. An adult male is said to have been shot in Norfolk about the year 1838 (Blyth, 'Naturalist,' iii. p. 413). An example was obtained in winter, about the year 1840, at Dingle Bay, by Dr. Chute (Thompson, B. of Ireland, iii. p. 161). A second Irish example, an immature female, was obtained on a lake near Knockdrin Castle, co. Meath, but no date is given of its capture (Watters, B. of Ireland, p. 215). A pair were procured, in the severe frost of December 1878, in Cork Harbour; and another example, in the yet more severe weather of January 1881, on the north coast of Kerry (Payne-Gallwey, 'Fowler in Ireland,' p. 121). An example supposed to have been obtained in Caithness some time before the year 1841 (Gray, B. of West of Scotl. p. 398) can scarcely be accepted as evidence of the occurrence of this bird in Scotland; nor can the alleged occurrence of three examples in the Firth of Forth, which were seen but not obtained on the 5th of May 1853 (Newton, 'Ibis,' 1867, p. 239). The statement that a pair were killed in the neighbourhood of Leeds (Gould, B. of Great Brit. pt. 10) is unaccompanied by any details of capture or proof of correct identification, and may be dismissed as more than doubtful; whilst the assertion that a pair were shot near Sheerness in March 1870 (Mathew, 'Zoologist,' 1870, p. 2182) was contradicted by the writer himself six years afterwards (Mathew, 'Zoologist,' 1876, p. 4958).

The geographical distribution of the Hooded Merganser on the American continent is almost exactly the same as its congeners. It breeds from the Atlantic to the Pacific, from about lat. 45° to the Arctic circle, wintering in the United States, Mexico, and the West Indies. It has occurred twice on the Bermudas, but is not known to have visited Greenland, Iceland, or the continent of Europe.

The Hooded Merganser does not differ much in its habits from its allies. During the breeding-season it frequents lakes and rivers, but always in some wooded district where it can obtain a suitable nesting-site. It is rather shy and is a very difficult bird to shoot, diving with great rapidity at the flash of the gun. It swims well, sitting lightly on the water, and it is said that no Duck exceeds it in fleetness of wing. Its food is principally composed of small fish and insects.

Like its congeners, the Goosander and the Smew, the Hooded Merganser always breeds in holes. It chooses some hole in a standing tree or even a hollow in a fallen log, which it is said to line with dry grass and leaves; a plentiful supply of down is added as the full clutch of eggs is laid and the female begins to sit. Mr. Boardman describes a contest he witnessed between a female Hooded Merganser and a female Wood-Duck for the possession of a hollow tree. The contest lasted several days, neither bird allowing its rival to remain long in peaceful possession of the hole. The nest contained eighteen eggs, about a third of which belonged to the Hooded Merganser.

The eggs of the Hooded Merganser are from five to eight in number, smooth in texture, and remarkable for their roundness. They are pure white, varying in length from 2·1 to 2·0 inch, and in breadth from 1·75 to 1·65 inch. The down with which the nest is lined, like that of the Smew and other Ducks breeding in holes, is very pale grey. The eggs of the Wood-Duck (*Anas sponsa*) very closely resemble those of the Hooded Merganser, but are, on an average, somewhat smaller. When the young are hatched, the female is said to convey them to the water in her bill, and she is much devoted to her brood. The little chicks readily take to the water, and dive with great agility when pursued.

In winter the Hooded Merganser becomes gregarious, uniting into flocks of between thirty and forty birds, which frequent the coast and may often be seen swimming on the sea at a considerable distance from the shore; it is also found at this season on the large freshwater marshes, especially when they are flooded. It obtains most of its food by diving; and probably the fishy nature of its diet is the reason that its flesh is held in such low esteem.

The Hooded Merganser is about the same size as the Smew, but has a much longer bill. The adult male in nuptial dress resembles that bird in having the back black, extending in two crescentic marks on each side of the breast. Except in the chin and throat being black, and the flanks being vermiculated with black and chestnut instead of black and white, there is no difference in the colour of the underparts between the two species. The crest is very much more developed and is white margined with black, which is the colour of the rest of the head and neck. The patches on the wing-coverts are grey instead of white; the white scapulars are replaced by

black; and the longest innermost secondaries are black with a broad white shaft-line. Bill black; legs and feet light brown; irides yellow. The female differs from the male in having a much smaller crest, which is almost uniform brown; the head, neck, and upper breast are greyish brown; the underparts are similar in colour to those of the male, but the flanks are not vermiculated. The upper parts below the neck closely resemble those of the male, but are somewhat browner. Young in first plumage closely resemble females, but are much browner. Males of the year are intermediate between adult males and adult females. Young in down are brown above, with tufts of white on the wings and on the sides of the rump, and the underparts are nearly white.

MERGUS ALBELLUS.

SMEW.

(Plate 67.)

Merganser cristatus minor, Merganser stellatus, } *Briss. Orn.* vi. pp. 243, 252 (1760).
Mergus albellus, *Linn. Syst. Nat.* i. p. 209 (1766); **et auctorum plurimorum—** *Temminck, Naumann, Dresser, Saunders,* &c.
Mergus minutus, *Linn. Syst. Nat.* i. p. 209 (1766).
Mergus albulus, Mergus pannonicus, } *Scop. Ann. I. Hist. Nat.* pp. 71, 72 (1769).
Merganser albellus (*Linn.*), *Bodd. Tabl. Pl. Enl.* p. 27 (1783).
Mergellus albellus (*Linn.*), *Selby, Gen. and Subgen. Birds,* p. 47 (1840).

The Smew is a rare straggler in winter to the coasts and inland waters of the British Islands, most frequent in its occurrence on the eastern coast-line of England and Scotland. It is found only at irregular intervals on the west coast of Scotland, but has occurred in most of the southern counties of that country; it is an equally rare and irregular visitor to Ireland, principally to the northern and central districts.

The Smew may be regarded as the Old-World representative of the Hooded Merganser of the New World, though their differentiation took place so long ago that the resemblances between the two species are very slight. The geographical range of the Smew appears to extend from the Pacific across Siberia and North Russia, as far west as the Baltic, and as far north as the Arctic circle. It is not known to visit Iceland or the Faroes, and is only an accidental wanderer on migration to the coasts of Scandinavia. In West Russia there is no evidence of its breeding south of the Gulf of Finland; but in East Russia Bogdanow found it breeding in the valleys of the Kama and the Lower Volga, whilst Henke states that it breeds in the delta of the latter river. These assertions do not seem very consistent with Severtzow's statement that it only occurs in winter in Turkestan, which is confirmed by Siberian travellers, who record it as passing through Southern Siberia and Mongolia on migration to winter in Japan, China, and Northern India. In the west it occurs in winter in the Caspian and Black Seas, Central and Southern Europe, and occasionally in North-west Africa. It has no very near ally.

Although the Smew is perhaps less of an oceanic species than any other Duck, it has the reputation of being the most expert diver of all its tribe.

It uses its wings under water like a Guillemot, darting after a fish with a speed that is almost incredible, and flapping gently to pick up a mollusk at the bottom, as if it was equally at home on or under the surface. It is one of the shyest of Ducks, and swims or dives rapidly from danger; but if forced to take wing it soon escapes with rapid and noiseless flight. Its note is a harsh *kr, kr*. Its food consists of small fish and water-insects of various kinds, but it is not known to eat any kind of aquatic vegetation.

The Smew is probably a somewhat early breeder, and eggs have been obtained in the Arctic regions from the first to the last week of July.

The eggs of the Smew were discovered by Wolley in Russian Lapland nearly thirty years ago. His account of the difficulties he met with, which were not finally overcome until he had been four years at work ('Ibis,' 1859, p. 69), is a model of patient research. It records the identification of the species from the description of the natives, who informed him that it bred in hollow trees, or in the boxes placed for the use of the Golden-eye, and that its eggs were something like those of a bantam; it further records his anticipations that they would prove to be like those of the Wigeon, perhaps whiter: but year after year passes by without any further light being thrown on the subject, until on the 30th of July, 1857, in Munioniska, he receives a box, sent from a distant village by one of his trusty Finnish friends, the assistant schoolmaster of the place. The box contains the skin of a female Smew caught on the nest, and three of the seven eggs found under her in the hollow of an old birch-trunk; but Wolley is quite staggered by the resemblance of the eggs to those of the Wigeon, until at length he convinces himself that there was a decided difference of texture, the eggs of the rarer Duck being smoother. Then follows the acquisition of the other four eggs belonging to the clutch, together with some of the down, which was very pale.

Harvie-Brown and I were fortunate enough to secure eggs of the Smew in North-east Russia. A few miles to the south of the Arctic circle, in the valley of the Petchora, is the small town of Haberiki, containing about a dozen houses. The timber for about a mile round has been cleared, but beyond the country consists of alternate lake, swamp, and forest. Grand old pines and larches, with stems three or four feet in diameter, conceal charming little alder and willow-fringed pools, and fallen trunks, covered with moss and lichen, provide excellent cover for watching the Ducks swimming fearlessly in these little paradises. The Smew is the greatest ornament of these picturesque little spots, but is not quite so common as Teal, Wigeon, and Pintail. We did not succeed in taking the nest of the Smew; but having commissioned some of the villagers to bring us eggs and down of Ducks, we were delighted to receive a clutch of what looked like Wigeon's eggs with pale grey down. The man who brought it knew the bird well, and told us that he had taken the eggs from a hollow

tree. On our return home we were able to verify the eggs by weighing them. The eggs of the Smew are on an average smaller than those of the Wigeon, but they are proportionally heavier. All my eggs of the Smew weigh more than two scruples and a half; a few of my largest eggs of the Wigeon just balance that weight, whilst one only, an abnormally rough egg, turns the scale. The following comparison of the difference in the measurement in inches between two eggs of each of these species will illustrate the point:—

Smew.		Wigeon.
1·9 by 1·48	weighs more than	2·25 by 1·55.
2·05 by 1·5	ditto	2·2 by 1·55.

The second Wigeon's egg is the very rough one already spoken of.

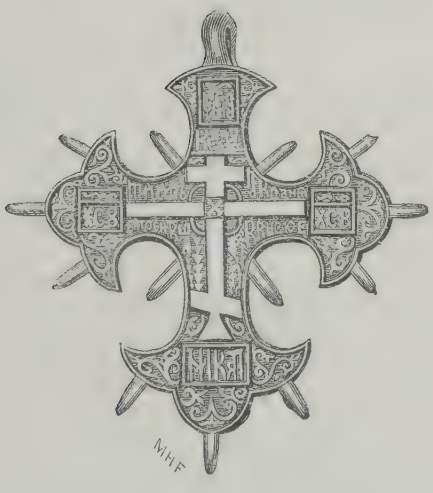
The eggs of the Smew are from seven to eight in number, creamy white, fine-grained, and slightly glossy, indistinguishable from those of the Wigeon except by weight. They vary in length from 2·05 to 1·9 inch, and in breadth from 1·52 to 1·42 inch. No Wigeon's egg as small would weigh two and a half scruples. The down is greyish white, scarcely distinguishable from that of the Golden-eye.

In winter the Smew is a gregarious bird, being seen in small flocks, which feed together for mutual safety, one generally keeping guard whilst the rest are diving.

The Smew is much smaller than the Goosander, and is scarcely larger than the Wigeon. The adult male in nuptial dress has the whole of the underparts white vermiculated with grey on the flanks, and with a few brown feathers amongst the under wing-coverts; the head and neck are also white, with a large black patch glossed with green on each side between the eye and the base of the bill, and another on each side of the nape, where they meet. The back is black; there are two narrow black crescents on each side of the breast; the scapulars are white margined with black, and are separated from the white median wing-coverts by a brown margin to the wing; the greater wing-coverts and secondaries are black tipped with white; but the innermost secondaries are grey, and the primaries are nearly black; the rump, upper tail-coverts, and tail are grey. Bill slate-grey; legs and feet pale slate-grey, darker on the webs; irides bright red.

The adult female has the forehead, crown, and nape chestnut, the feathers of the latter elongated to a conspicuous crest. The rest of the upper parts are slate-grey, obscurely barred with pale grey, and shading into almost black on the lower back; but the wings are coloured like those of the male. A large black patch extends from the eye to the base of the bill; an ill-defined grey ring passes round the lower neck; the

flanks are grey, but the rest of the underparts are white. Young in first plumage closely resemble adult females, but the space between the base of the bill and the eye is chestnut instead of black, there are more dark feathers on the breast and flanks, and the white patch on the wing is suffused with brown, especially in the young females. Males in first nuptial dress have brown streaks on the hind neck and scapulars. Males in moulting-plumage closely resemble adult females; but dark crescentic markings on the sides of the breast, and other markings on the wing-coverts, indicate the peculiarities of the male plumage. Young in down have the upper parts dark brown; there are white spots below the eye, also on the wings, flanks, and sides of the rump. The underparts are white, suffused with grey on the breast and flanks.



Family PELECANIDÆ, or PELICANS.

The Pelicans form a well-defined family, although the genera present so much structural variation that many ornithologists divide them into half a dozen families, which may possibly be regarded as subfamilies. They may be diagnosed as follows :—

	PHAETON. (*Tropic-birds.*)	Central tail-feathers very much elongated.
	SULA. (*Gannets.*)	
Tail-feathers with very rigid shafts	PLOTUS. (*Darters.*)	
	PHALACROCORAX. (*Cormorants.*)	A strongly curved hook at end of bill.
Tail deeply forked	FREGATA. (*Frigate-birds.*)	
	PELECANUS. (*Pelicans.*)	

Sclater elevates these five groups to the rank of families, and combines them into an order, which he appears to regard as nearest related to the Herons and their allies, and somewhat more distantly to the Birds of Prey. Forbes acquiesced in this arrangement, but associated the Petrels with them in the same great group. Gadow, on the other hand, takes quite a different view of their affinities, and considers the Pelicans, the Penguins, and the Divers to be three highly specialized groups of birds, descended from the branch of which the Ducks are the least changed survivors. When more materials for a classification of birds have been collected, it will probably be found that the Ducks, Flamingoes, Herons, Pelicans, Grebes, and the allies of each of these families form a compact and fairly well-defined order.

In the modification of their palatal bones, the birds belonging to this family are desmognathous, in which respect they agree with the Ducks, Storks, and their allies, to which probably they are nearly related, and

with the Birds of Prey, Owls, Parrots, and several other Picarian families, to which their relationship appears to be very remote. Nitzsch remarks that they have a very persistent type of pterylosis. The posterior margin of the sternum varies considerably in its shape, in some cases being only slightly undulated and in others having one and occasionally two notches on each side.

The Pelicans are born naked, but are soon covered with down. They remain in the nest and are fed by their parents until they can fly. They retain their first plumage until their second autumn *, moulting regularly at that season afterwards. In winter, before they pair, a further change takes place; probably no feathers are moulted, but in many species a crest is assumed, and other feathers or ornamental filaments appear, which are gradually lost by abrasion during spring and summer.

The most obvious external character of the Pelicans is their webbed feet. They are the only group of birds in which the hind toe is connected with the inner toe by a web. They have invariably long and powerful wings, but the length of the tail and the formation of the bill varies much. Their tarsi are covered with small reticulated scales.

The family may be regarded as almost cosmopolitan, but it is not represented in the Arctic regions. It contains about sixty species, of which six breed in Europe, but only three in the British Islands.

* Cormorants in immature plumage may be obtained through the winter and spring, and in July and August they may be obtained in full moult from immature to adult plumage, when they are rather more than a year old. The same remarks apply to the Gannets, except that they moult into a partially adult plumage, the fully adult plumage not being assumed until the fifth year.

Genus SULA.

The Gannets were included by Linnæus in the genus *Pelecanus*; but in 1760 Brisson, in his 'Ornithologia' (vi. p. 494), established the genus *Sula* for their reception. The Booby Gannet, *Sula leucogastra* (being the *Sula sula* of Brisson), is the type.

The Gannets differ from the Cormorants in having the middle toe as long or longer than the outer toe, and in having the bill very slightly hooked. They agree with the Cormorants and differ from the Pelicans in having only slight indications of a gular pouch. They have long pointed wings and long wedge-shaped tails. The nostrils are obsolete. Their prevailing colours are white and black.

Seven species of Gannet are known, four of which inhabit the tropics; one breeds in South Africa, one in New Zealand, and one in the North Atlantic. The latter species is the only one found in Europe.

The Gannets are exclusively oceanic birds, feeding almost entirely on fish. When in search of food, they do not dive like Guillemots, though if wounded they can do so with ease. They plunge perpendicularly on their prey, like a Tern. Their flight is rapid, but performed by slow deliberate flaps of their long wings. They swim with the greatest ease, but on land their motions are awkward. They breed on rocks, in colonies, making a large nest, but laying only one egg, which is white without spots and with a very rough surface.

SULA BASSANA.

GANNET.

(Plate 34.)

Sula major, *Briss. Orn.* vi. p. 497 (1760).
Sula bassana, *Briss. Orn.* vi. p. 503 (1760); **et auctorum plurimorum**—(*Gmelin*), (*Latham*), *Temminck*, *Dresser*, *Saunders*, &c.
Pelicanus bassanus, *Linn. Syst. Nat.* i. p. 217 (1766).
Pelicanus punctatus, *Sparrm. Mus. Carls.* pl. x. (1786).
Pelicanus maculatus, *Gmel. Syst. Nat.* i. p. 579 (1788).
Sula alba, *Meyer*, *Taschenb.* ii. p. 582 (1810).
Dysporus bassanus (*Linn.*), *Illiger*, *Prodromus*, p. 280 (1811).
Moris bassanus (*Linn.*), *Leach*, *Syst. Cat. Mamm. &c. Brit. Mus.* p. 35 (1816).
Sula americana, *Bonap. Comp. List B. Eur. and N. Amer.* p. 60 (1838).
Sula lefevri, *Baldamus*, *Naumannia*, 1851, pt. iv. p. 38.

The Gannet is a resident throughout the British Islands, but is confined to very few breeding-colonies. By far the largest of these (estimated at 150,000 pairs) is situated on Sula S'Geir (erroneously marked North Barra in some maps, but Sulisker in the Admiralty chart), a rock about five-and-thirty miles due north of the Butt of Lewis. Halfway between this rock and the Orkneys is an offshoot of this colony (estimated at 25,000 pairs) on Stack Island, or the Stack of Suliskerry. To the west is a colony (estimated at 25,000 pairs) on the island of Borrera, and some of the adjacent stacks, in the St.-Kilda group. Only two other breeding-places of the Gannet near the Scotch coast are known—the celebrated Ailsa Craig at the mouth of the Firth of Clyde on the west coast, and the still more celebrated Bass Rock at the mouth of the Firth of Forth on the east coast. The number of pairs breeding at the two latter localities is estimated at 6000 each. England can boast of only one small colony on Lundy Island, with a still smaller offshoot on an island off the coast of Pembrokeshire. Ireland also possesses only one colony (estimated at 1000 pairs), having its headquarters on the Bull Rock in the extreme south-west, with a small adjunct on the adjacent Cow Rock, and another on the more distant Little Skellig.

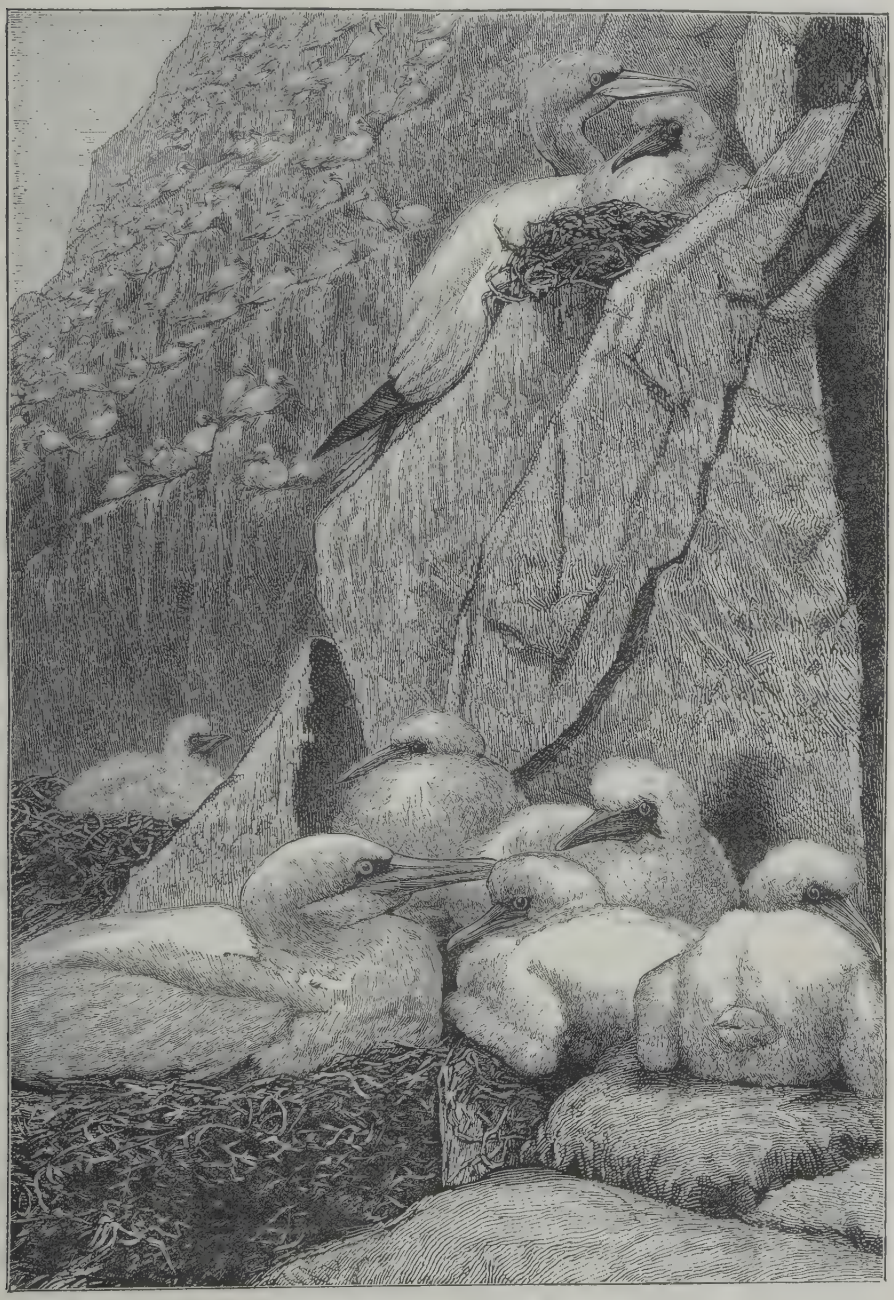
The Gannet is an oceanic species, and is only known to breed on a few islands in the North Atlantic Ocean. There is a colony on the Grand Menan rock in the Bay of Fundy, and another on Magdalene Island and the adjoining rocks in the Gulf of St. Lawrence. It is only an accidental straggler to Greenland; but there are several colonies near the coasts of

Iceland, and a large one on the Faroes, besides the scattered colonies on the British Islands already mentioned. In winter it is distributed along the entire coast of Western Europe, occasionally entering the Baltic and the Mediterranean, and straying as far south as the Canary Islands. On the American coast it wanders in winter as far south as the Gulf of Mexico. The Gannet has several allies, but from all of them it may readily be distinguished by having the cheeks and the sides of the chin and throat feathered instead of being denuded of plumage.

The Gannet is a bird of remarkably powerful flight, and, like the Albatross and the Frigate-bird, lives almost exclusively in the air. It soars for a great height, or wheels round and round, sometimes with no perceptible movement of its ample wings. Although it frequently alights on the water it does not generally remain long, unless when gorged with food or to sleep. It appears to avoid flying over land, and prefers to follow a winding coast rather than to take a short cut by passing over a headland. Saxby, however, states that he has seen this bird sailing about inland, probably attracted by the flocks of Herring-Gulls feeding in the meadows below. On the land its movements are awkward. Gannets repeatedly fly for immense distances to feed, a hundred or even two hundred miles in a day being often traversed. Where the shoals of fish are sporting near the surface of the sea the Gannets abound. Few sights are prettier than a flock of these birds engaged in searching for food. High up in the air they may be seen soaring in graceful flight, first one and then another dropping with a loud splash into the sea, as if hurled downwards with great force, disappearing for a few moments, and then rising to the surface. They may be continually seen falling from the air like large white stones, or rising from the waves to join the soaring flock above. The Gannet does not dive, in the strict sense of the word, unless in its frantic efforts to escape when wounded in the wing. Sometimes it plunges into the sea from only a moderate elevation, but very often from a height of a hundred yards or more. Gray states that the Gannet generally feeds in water where the bottom is sandy; but this is by no means always the case. It may be seen fishing in all parts of the sea, often in very deep water, its movements apparently being regulated only by the presence of the shoal near the surface. The fish are often followed for great distances, even when the birds are engaged at their breeding-places. Each morning the Gannets come to that part of the sea where the fish are plentiful and, after satisfying themselves, return to the distant breeding-place.

The food of the Gannet appears to be exclusively composed of fish, which it almost invariably catches by plunging from the air into the sea. In the British seas it catches enormous numbers of herring and whiting; it also eats mackerel, haddocks, pilchards, sprats, anchovies, and some other fish. The Gannet is a very greedy bird. Like the Cormorant it appears

to soon digest its food, and is constantly on the look-out for more, often eating to such excess as to be unable or unwilling to rise from the sea,



whither it generally retires to sleep off the effects of its inordinate appetite.

Macgillivray observed the Gannet fishing like a Gull, by hovering above the shoal of fish and picking them from the water. The notes of the Gannet are very harsh and discordant; they are generally uttered at the breeding-place when the birds are disturbed, and resemble the syllables *carra*, oft repeated and modified in different ways.

The Gannet breeds in large colonies, and is apparently very fastidious in its choice of a haunt, a steep ocean-rock being generally selected for the purpose. In some places the colonies are enormously large. The first eggs are laid early in May, the nests being built about a week before. One of the most interesting breeding-places of the Gannet is the far-famed Bass Rock in the Firth of Forth. Nest-building begins about the end of April, but many birds delay operations until the middle of May. Every available ledge is occupied by a nest, in fact the rock overflows with them, and on the top a number of nests are placed for which there is literally no room on the ledges of the cliffs. The nests are generally slight, often trodden out of all shape, and smell most offensively, owing to the number of half-digested fish lying about them which have been cast up by the old Gannets when disturbed from their eggs. They are made of seaweed picked up from the waves below, bunches of turf pulled up from the summit of the cliffs, and a few straws. They are very shallow; and as the materials with which they are composed wear away, the old birds are constantly adding to them. Sometimes a bird will steal from its neighbour's nest; then a contest takes place, and perhaps the two birds will roll over the top of the cliff and flutter downwards, until they get fairly on the wing. The sitting Gannets take but little notice of an intruder, generally remaining on their eggs until pushed off, when they often cast up a half-digested fish and flutter into the air. Some are very reluctant to leave their eggs, and with bill wide open endeavour to frighten the intruder away. The scene is a most imposing one. Thousands of Gannets are sailing to and fro before the mighty cliffs, every part of the rocks that can support a nest is crowded with birds; birds are constantly coming to and leaving the cliffs; the harsh notes of remonstrating and quarrelling Gannets sound in all directions; whilst numbers are to be seen sitting quietly on the greensward on the top of the rocks, or fast asleep with their bills and heads almost hidden amongst their dorsal plumage. No bird is more graceful in the air than the Gannet; it often seems to float without perceptible exertion, and hovers with wings apparently at rest. When flying, the head is held in a straight line with the tail, and the legs are stretched out under the tail. When alighting on the cliffs, the Gannet comes down in a fluttering, heavy, and clumsy manner, often failing to get a foothold, and falling back into space when the attempt has to be renewed. The Gannet only lays a single egg; but if that be removed it will lay again.

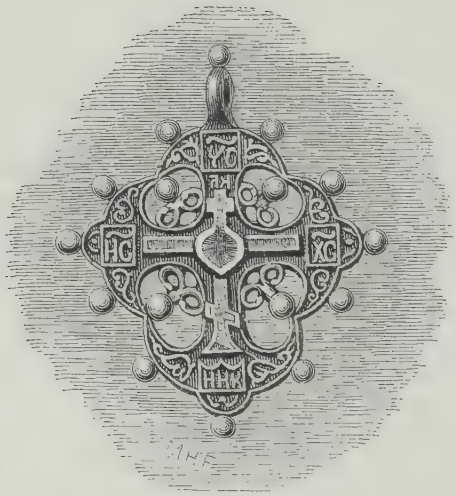
The colony of Gannets at St. Kilda is situated principally on two enormous rock-stacks near the island of Borrera. These stacks are made conspicuous at a great distance by the tens of thousands of Gannets that cluster on them; they appear as if covered with a white cloth, so thickly do the birds congregate upon them; and when the Gannets are disturbed the air is filled with a dense fluttering throng, although the cliffs are not visibly decreased in whiteness. Vast numbers of these birds are caught by the St.-Kildans, not only for food but for the sake of the oil and feathers that they yield.

The eggs of the Gannet, as seen through the hole when held up to the light, are emerald-green, and occasionally traces of this colour can be seen on the outside; but usually the surface is thickly coated over with a layer of white, which in some places appears to be very clumsily laid on. They are nearly uniform ovals, which vary in length from 3·4 to 2·8 inch, and in breadth from 2·15 to 1·85 inch. An exceptionally small egg measures 2·65 inch in length and 1·8 inch in breadth. The egg of the Gannet cannot easily be confused with that of any other British bird, but exceptionally small examples are shorter than the longest eggs of the Cormorant, though never so narrow.

The Gannet only rears a single nestling, which is assiduously fed by its parents, the fish never being brought to the nest in the bill, but always being disgorged. The sitting bird is fed by its mate, who usually brings the fish and leaves it at the side of the nest. At the Bass Rock numbers of young birds are taken, plucked and roasted, and sold by the lessee of the rock, who is also the landlord of the Canty-Bay Inn. The feathers are sold in great quantities. During the winter the Gannet wanders far from its breeding-places, following in the wake of the shoals of fish. Its great powers of flight enable it to wander great distances over the sea, in search of the fish that feed near the surface.

The Gannet is rather smaller than a Goose. The sexes do not differ in colour, nor is it known that there is any important seasonal change of plumage in adult birds. The general colour of both upper and underparts is pure white, except the primaries and primary-coverts which are nearly black. After the autumn moult the feathers of the head and neck are suffused with buff, which appears to intensify in early spring and fade again after incubation has commenced. Bill pale grey, the lines on the upper mandible blackish blue, as are also the bare spaces at the base of the bill, round the eyes, and on the throat; legs and feet dull black, the frontal scutellæ emerald-green; irides pale yellowish white. The young when newly hatched are naked and dark slate-grey in colour, but soon become clothed with thick pure white down. Young in first plumage have the upper parts dark brown sparingly streaked with white, and the underparts buff mottled with greyish brown. After their first moult in their second autumn, when

they are rather more than a year old, the upper parts are very little changed, except that the head and neck are mottled with white, and the brown mottlings on the underparts have almost disappeared. After the second moult, the head, neck, and underparts are nearly white, and large patches of white appear on the scapulars, wing-coverts, and tail-feathers. After the third and fourth moults, the black on the upper parts gradually disappears, and the adult plumage is assumed after the fifth moult.



Genus PHALACROCORAX.

The Cormorants were included by Linnæus in the genus *Pelecanus*, but in 1760 Brisson, in his 'Ornithologia' (vi. p. 511), provided the genus *Phalacrocorax* for their reception. The Common Cormorant, *P. carbo* (being the *Phalacrocorax phalacrocorax* of Brisson), is the type.

The Cormorants may be distinguished from the species in the other genera of the Pelecanidæ by the length of the outer toe, which is longer than any of the others. They have a strongly curved hook at the end of the bill, and their nostrils are obliterated when they become adult. They have rather short wings, but a moderately long tail. Their prevailing colours are dark brown, with metallic green, blue, or purple reflexions.

There are probably about thirty species of Cormorant, which are distributed over most parts of the world, except in the arctic regions and in the Pacific islands. Three species are found in Europe, but only two of them are British.

The Cormorants frequent the sea-coasts, lakes, and large rivers, and feed almost exclusively on fish. Their somewhat short wings cause them to fly, like Ducks, in a straight line, with rather rapid motions of the pinions, but they swim and dive to perfection. They perch freely on rocks and trees, but walk clumsily. They make large nests on the ground, on rocks, or in trees. Their eggs are few in number, creamy white or bluish white, without spots, and, like those of the Pelicans, Gannets, Grebes, and Flamingoes, are remarkable for the roughness of the surface.

PHALACROCORAX CARBO.

CORMORANT.

(Plate 34.)

Phalacrocorax phalacrocorax, *Briss. Orn.* vi. p. 511 (1760).
Pelecanus carbo, *Linn. Syst. Nat.* i. p. 216 (1766); **et auctorum plurimorum—**
Gmelin, Latham, (Bonaparte), (Dresser), (Saunders), &c.
Procellaria pelecanus, *Müll. Zool. Dan. Prodr.* p. 18 (1776).
Carbo cormoranus, *Meyer, Taschenb.* ii. p. 576 (1810).
Halieus carbo (*Linn.*), *Illiger, Prodromus,* p. 279 (1811).
Phalacrocorax carbo (*Linn.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 34 (1816).
Hydrocorax carbo (*Linn.*), *Vieill. N. Dict. d'Hist. Nat.* viii. p. 83 (1817).
Phalacrocorax novæ-hollandiæ, *Steph. Shaw's Gen. Zool.* xiii. pt. i. p. 93 (1825).
Phalacrocorax medius, *Nilss. Skand. Fauna, Fogl.* ii. p. 478 (1835).
Phalacrocorax carboïdes, *Gould, Proc. Zool. Soc.* 1837, p. 156.
Carbo albiventris, *Tickell, Journ. As. Soc. Beng.* xi. p. 463 (1842).
Halieus cormoranus (*Meyer*), *Naum. Vög. Deutschl.* xi. p. 52 (1842).
Graculus carbo (*Linn.*), Graculus medius (*Nilss.*), Graculus carboides (*Gould*), Graculus novæ-hollandiæ (*Steph.*), *Gray, Gen. B.* iii. p. 667 (1845).

The Cormorant is a common resident in the British Islands, and breeds in all suitable districts from the Shetlands to Cornwall and from St. Kilda to the south of Ireland. Unlike the Shag it has several breeding-places far inland, both on trees as well as on rocks, but its usual stations are on rocky islands and the gigantic bird-cliffs which stud our coasts from Flamborough northwards, and in the south-west of England and in Wales. In Ireland it is equally well known and widely distributed, breeding inland and on the coasts. In winter its range is even more extended, and it visits low-lying shores as well as inland sheets of water.

The Common Cormorant is an Old-World species which has extended its range in the Atlantic westwards to the Faroes, Iceland, Greenland, the coasts of Labrador, the Gulf of St. Lawrence, and the Bay of Fundy, in all of which localities it is a partial resident, wandering in winter as far south as Delaware Bay. It is a resident throughout the coast of Western Europe, including the Baltic, from the northern shores of the Kola peninsula southwards. In the basin of the Mediterranean it is principally known as a winter visitor, though there are several breeding-places on the northern shores and in Algeria. To the rest of Africa it is a winter visitor, occasionally found as far south as the Cape. It breeds in many inland

localities in Europe, and eastwards on the shores of the Black and Caspian Seas. It is a winter visitor to Persia, a resident in Turkestan, a summer visitor to Southern Siberia, principally known on migration in Mongolia, and wintering in Japan and China. It is a resident in North India and Burma, and a winter visitor to South India and Ceylon. It is a resident in the islands of the Malay Archipelago, Australia, Tasmania, and New Zealand.

The nearest ally of the Cormorant is *Phalacrocorax capillatus*, a resident in Japan and Northern China. This is a very distinct species, differing from the Common Cormorant in having larger feet, the plumage glossed more with green, and the feathers of the upper back, the scapulars, wing-coverts, and innermost secondaries bronzy green margined with black, as in the Shag, instead of bronzy brown margined with black; the white patch on the sides of the head and throat is also profusely streaked with dark green, and the nuptial filaments on the head and neck are more hair-like, whence its name. On the Pacific coast of North America from Vancouver Island to the southern extremity of the Californian peninsula our Cormorant is represented by *P. penicillatus*, a somewhat intermediate species, having the white throat of *P. carbo* and the green back, scapulars, and wing-coverts of *P. capillatus*. It differs from both in its nuptial filaments, which are confined to two long tufts on each side, one above the ear-coverts and the other on the upper scapulars. It has been alleged that examples of the Common Cormorant from Australia and New Zealand differ from our bird in having the feathers glossed with green instead of purple, but British examples differ considerably in this respect. These three species, as well as the other Cormorants, have fourteen tail-feathers, the Shag and its allies having only twelve.

The Cormorant is to a large extent an oceanic bird, but wherever fish is to be obtained, be it salt water or fresh, be it river or lake, the Cormorant, if not molested, is almost sure to be found. On some of the great Siberian and Chinese rivers it may be seen a thousand miles or more from the coast. It is only a migratory bird in localities where its feeding-grounds are frozen up in winter; but during that season it often wanders far and wide, and birds of the year probably migrate southwards in autumn from all the principal breeding-stations. The flight of the Cormorant is intermediate between that of a Guillemot and a Heron; like both those birds it stretches out its long neck, but the legs are not straddled out like those of the former, but stretched out under the tail like those of the latter. The wings are generally moved with great rapidity like those of a Duck; but not unfrequently the motion is more deliberate as in the Heron, and occasionally it skims over the surface with outspread motionless wings like a Grouse. The Cormorant appears to most advantage on the water; the backward position of its legs enables it to

swim with great ease, and under the surface it dives almost like a fish, using its wings as freely as in the air. On land it looks a lazy bird and is seldom seen to walk. It sits for long together perched on a rock, digesting the fish with which it has overgorged itself, but it is generally too wary to be surprised. It is a remarkably silent bird, but occasionally utters a harsh croak. Its food is almost entirely fish, and from time immemorial it has been tamed and trained to catch fish, a practice still continued by the Chinese and Japanese.

At the Farne Islands the Cormorants breed on an irregular reef of rocks rising on one side somewhat abruptly out of the sea to a height of ten to twenty feet, and sloping on the other gradually down to a rocky shingly shore. When I first visited the island sixteen years ago, we saw the weird-looking birds standing some on the rock and some on the edges of their nests, stretching out their long snake-like necks, evidently much alarmed at the approach of our boat. Before we were near enough to land they took wing, and retired to a distant part of the island, one old bird, apparently the patriarch of the colony, being the last to leave. The entire surface of the rocks was yellow-washed with the droppings of the birds, and fragments of fish were lying about in all directions, so that the smell was very strong. We counted upwards of seventy nests—large structures, heaps of seaweed, from one to two feet high, and generally lined with the fresh green leaves of the sea-parsley and other maritime plants growing on the island. The number of eggs in each nest never exceeded three. Before we had fairly pushed our boat from the rocks, the birds began to return to their nests. We afterwards visited a much smaller colony in another part of the same island. One of the lighthouse-keepers told me that Cormorants are to be seen near these islands all the year round; they begin to repair their nests in April and have eggs early in May.

In 1880 I visited a much larger colony of Cormorants in an entirely different locality, on the flat banks of the Horster Meer, between Amsterdam and Utrecht. The country is perfectly flat, and the nearest sea-water is the south shore of the Zuider Zee, some eight or ten miles to the north. The colony consisted of about two hundred nests, placed upon a bare piece of ground, and all within a radius of not more than six or seven yards. The nests, many of which touched each other, were piles of sticks and reeds from one to four feet high, and were generally lined with a little fresh green grass. The foundations of many of the nests looked very old and rotten; but it appears that a new nest is built every year upon the ruins of the old one. The locality had evidently been occupied a considerable time, for all trace of vegetation had long ago been burnt off by the superabundance of manure; the ground and the sides of the nests were white with the droppings of the birds, and scattered here and there were

fishes, some half a pound in weight, in various stages of decomposition. When we first came up the nests were black with birds; but as we approached they rose, and after flying round for some little time, alighted on the lake. Whilst we remained detachments of Cormorants frequently came up to watch our movements. Not far off was a colony of Spoonbills, and we passed several small outlying colonies of Cormorants, who had built their nests in the small willow bushes growing in the marsh. The date was the 23rd of May, and the nests had been robbed of their eggs twice a week for some time.

The Cormorant, however, is able, like the Heron, to alter the date of its breeding according to circumstances. In 1883 the Cormorants on the Lower Danube had fresh eggs on the 5th of June. The nests were built in pollard willows, not far from a large colony of Herons. The country for miles round was under water, which was six feet deep or more under the nests. The birds have learnt that they cannot breed with safety until the snows of the Alps and the Carpathians begin to melt fast enough to flood the country. The nests were large structures built principally of sticks and generally placed in the main forks of the pollard willows, only a foot or two above the level of the flood. The Cormorant looks altogether out of place perched in a tree, especially on the somewhat slender branches of the willows.

I am indebted to my friend the late Mr. Charles Doncaster, of Sheffield, for the following interesting account of the breeding of the Cormorant in South Wales :—

"The Bird-Rock near Towyn is a rock looking at a distance rather like the top of one of the Langdale Pikes. It is precipitous for about 400 or 500 feet from the summit, the bottom being loose shingle. On an overhanging rock at the summit I counted on the 19th June, 1869, thirty Cormorants' nests from this one point of view. This rock being three miles from the sea, the nests are made of sticks and twigs instead of seaweed, and lined with a little fresh green herbage. One bird, having apparently some sense of the beautiful, had pulled up a long spike of foxglove flower, and twisted it round the nest as a lining. Of six nests in sight containing eggs five had two and one had three eggs. One old bird sitting on her nest looked up contemptuously at me and would not move when a stone bounded from the rock above it, except to stand up, showing its large webbed feet and two eggs in the nest. In some nests there was one young bird, many had two, and one had three. The old birds were clumsy at alighting on the ledges. When flying against the wind, just before perching, they moved from side to side, making a loud noise with their wings, like a gust of wind."

The most interesting colony of Cormorants in trees which I have seen is on an island in Lough Cooter, near Gort, in the south of Galway. It

is ten miles from the sea as the crow flies, and consists of perhaps fifty nests built on lofty trees, and close to an equally large colony of Rooks. On another island on the same property is a heronry, which is also adjacent to, and more or less blended with, a rookery.

The eggs of the Cormorant when held up to the light are emerald-green, like those of the Gannet; the white coat which covers the shell is sometimes almost as rough as it is in the Gannet, but the green can always be more or less seen through it in patches. They differ very slightly from eggs of the Gannet, except in being smaller in size and slightly more elongated in shape. They vary in length from 2·9 to 2·4 inch, and in breadth from 1·75 to 1·5 inch. Small eggs of the Cormorant are absolutely indistinguishable from large eggs of the Shag.

In 1882 a pair of Cormorants bred in the Gardens of the Zoological Society of London on a felled tree-stump; and this year Mr. Janse, the

librarian of the Amsterdam Zoological Gardens (under whose guidance Capt. Elwes and I had the pleasure of visiting the colony of Spoonbills in

1880), informs me that a pair of Cormorants bred on the branch of a tree overhanging one of their ponds. The habits of birds in confinement are not always a true guide to those of the species in a wild state; but if it be safe to generalize from two such entirely independent series of facts, the following important conclusions are arrived at. The Cormorant begins to lay late in March or early in April; both parents take their turn in the duties of incubation, which lasts about twenty-eight days; the task of sitting on the nest to keep the newly hatched young warm devolves upon the female, whilst that of feeding the family is undertaken by the male, who disgorges his partly digested food and allows the young to feed out of his mouth.

The Cormorant is intermediate in size between a Duck and a Goose. There is no difference in the colour of the plumage of the adult male and female, but the latter is slightly smaller. After the autumn moult it is a very handsome bird, the prevailing colour of the plumage being black, richly glossed with metallic purple and green; the wing-coverts, scapulars, and feathers of the upper back are bronzy brown with blackish-green margins; a white gorget extends across the upper throat and on the sides of the head; the quills and tail-feathers are black, slightly glossed with green. Bare part of the face and throat yellow; bill black above, shading into grey on the sides and yellow at the base; legs and feet black; irides emerald-green. In nuptial dress the head and neck are thickly sprinkled over with long, slender, white filaments, whilst on each thigh is a large white patch of silky plumes. Young in first plumage have the general colour of the upper parts brown, shading into dirty white on the underparts; the feathers of the upper parts have dark margins and a slight gloss of green, which is also perceptible on the head and hind neck. After the first autumn moult, when the bird is rather more than a year old, an intermediate plumage is assumed, having much more metallic gloss on the upper parts and much less white on the underparts than in first plumage. Young in down are a nearly uniform sooty black, with a flesh-coloured bill and dark brown feet with pale brown webs *.

* Dresser, in his 'Birds of Europe,' has made a curious muddle of the seasonal changes of plumage of the Cormorant, in consequence of his ignorance respecting the moulting of birds, a subject which he persistently ignores throughout his work. He appears to be unacquainted with the facts that the Cormorant only moults once in the year, in autumn, when it acquires its winter plumage, that in this dress both the white filaments on the head and neck and the white plumes on the thighs are absent, that these nuptial adornments are acquired in very early spring in time for the pairing-season (say in February), and that in May, when incubation commences, they are cast, leaving the abraded summer plumage similar to that of early winter. The adult in full summer dress figured by Dresser has cast the white filaments on the head and neck, but still retains the white plumes on the thighs; what he calls his adult in winter plumage is a bird in full nuptial dress.

PHALACROCORAX GRACULUS.

SHAG.

(Plate 34.)

Phalacrocorax minor, *Briss. Orn.* vi. p. 516 (1760).
Pelecanus graculus, *Linn. Syst. Nat.* i. p. 217 (1766); **et auctorum plurimorum**—*Gmelin, Latham,* (*Temminck*), (*Dresser*), (*Saunders*), &c.
Procellaria graculus (*Linn.*), Procellaria cristatus, } *Müll. Zool. Dan. Prodr.* p. 18 (1776).
Pelecanus cristatus (*Müll.*), *Faber, Faun. Grœnl.* p. 90 (1780).
Carbo graculus (*Linn.*), *Meyer, Taschenb.* ii. p. 578 (1810).
Phalacrocorax graculus (*Linn.*), *Leach, Syst. Cat. Mamm. &c. Brit. Mus.* p. 34 (1816).
Hydrocorax cristatus (*Müll.*), *Vieill. N. Dict. d'Hist. Nat.* viii. p. 89 (1817).
Carbo cristatus (*Müll.*), *Temm. Man. d'Orn.* ii. p. 900 (1820).
Halieus graculus (*Linn.*), *Licht. Verz. Doubl.* p. 86 (1823).
Phalacrocorax cristatus (*Müll.*), *Steph. Shaw's Gen. Zool.* xiii. pt. i. p. 83 (1825).
Carbo desmaresti, *Payraudeau, Ann. des Sci. Nat.* 1826, p. 460.
Graculus cristatus (*Müll.*), Graculus linnæii, Graculus desmarestii (*Payr.*), } *Gray, Gen. B.* iii. p. 667 (1845).

The Shag is a well-known and common resident in the British Islands, frequenting in considerable numbers most rocky coasts where the cliffs abound with caves and hollows, in which it loves to shelter and rear its young. During winter it wanders far from home, but, being exclusively maritime, it very rarely visits inland districts, unless accidentally driven by gales.

The Shag appears to be confined during the breeding-season to the rocky coasts of Europe. It is a resident in Iceland and on the Faroes, on the entire coast-line of Norway, the French, Spanish, and Portuguese coasts, and throughout the basin of the Mediterranean, except on the low-lying shores. In winter its range is slightly more extended, though it rarely enters either the Baltic or Black Seas. The Shag has numerous allies in various parts of the world, with none of which is it liable to be confused.

Unlike the Cormorant, the Shag is almost exclusively a marine species, and seldom wanders from the sea to inland fishing-grounds. It loves best to frequent those parts of the coast that are rocky, especially if there be small islands and plenty of caves and fissures amongst the cliffs, in which it not only rears its young, but takes shelter. Sometimes it may be seen sitting on the shelves of the cliffs, or more often basking on some sea-girt

rock, with wings outspread, as if it were drying them after its aquatic gambols. In most of its habits it very closely resembles the Cormorant. In early morning it may be seen emerging from its favourite cave or fissure, speeding low and rapidly over the sea to its feeding-place, looking quite black against the sea or almost white as the sun glistens on its metallic plumage. The flight of the Shag is quick, performed with regular and rapid beats of the wings, and when alighting the bird drops into the water with a great splash. At all times of the year the Shag is more or less gregarious, and sometimes a flock of a hundred or more may be seen fishing in company. It is not quite so shy as the Cormorant, especially when feeding alone; but it is generally wary enough not to allow any one to come within gunshot, unless when approached in a boat. Like the Gannet, it seems to dislike flying over land, and will go a long way round rather than make a short cut over a narrow strip of beach. No birds excel the Shag in its marvellous powers of diving. Though able to fly well and rapidly, the water is its true haunt, and it always prefers to escape from an enemy by plunging into the sea, where it is safe, than to trust to its wings to carry it out of danger.

The Shag may often be seen feeding along a rock-bound coast, swimming close in-shore where the water is shallow; it swims well, sitting rather low in the water, with head and neck held up. When it sees a fish in the water below, it springs forward with a graceful curving motion, rises almost out of the water, and then plunges down headlong. Sometimes it remains down much longer than at others; and the captured fish is usually brought to the surface to be eaten. Few fish are more agile in the water than the Shag. It "beats them at their own game," pursuing them through the water, using its wings as well as its feet to aid it in the chase. It sometimes dives to a great distance; and the fish that it pursues are always caught in the bill. The food of the Shag is composed almost exclusively of fish, but doubtless other small marine animals are devoured. The note of this bird, like that of the Cormorant, is a harsh guttural croak, seldom heard except at the nest.

The Shag is by no means so exclusively a gregarious bird during the breeding-season as the Cormorant; it may even be doubted whether it is by preference a gregarious bird at all in summer. It is true that large colonies of Shags are to be found; but the Shag is, if possible, a cave-breeding bird, and wherever caves are to be found on the coast, especially if they are only accessible to a boat, any available ledge where a nest can be placed is occupied by a pair of Shags. Caves of this kind are comparatively rare, and are consequently much sought after by these birds—so much so, that frequently every available ledge is occupied. On rocky coasts where there are no caves the Shag is generally found breeding in isolated pairs on ledges, and it is only on rocks where suitable ledges are

not easily found, or where the Shag is especially numerous, that it becomes gregarious.

The Shags begin to take an interest in their old nests in April, and the eggs are laid early in May. Birds that have to build a nest begin operations towards the close of April, and fresh eggs may be found during May and the first half of June. The Shag always prefers a cave, if it can obtain one, for nesting-purposes. Numbers of birds breed close together, every possible place being occupied in some of the caves where it makes its nest. In some districts where suitable caves are not to be found, the Shags build their nests on the ledges of the cliffs, generally where they overhang considerably. Sometimes the nest is built on a ledge in the cave far from the opening, but less frequently it is made at the entrance, the cliff below it being white with the droppings of the bird, and making it a very conspicuous object. The nests are bulky structures, made principally of seaweed, masses of turf, sprays of heather, and perhaps a few straws and bits of dead grass. The whole structure is matted closely together by the incessant pattering of the bird's wet feet and the remains of decaying fish. It smells most offensively; and by the time that the young are able to leave it is little more than a fœtid mass of decayed fish and rotten vegetation. As the rocks are approached in a boat, the old Shags may be seen anxiously watching the intruders, swaying from side to side, as if hesitating whether to plunge into the water or await the result of the intrusion. One by one the sitting birds dart off their nests, some flying rapidly overhead far out to sea, others diving into the water below to make their escape by that means. Out of the dark cavern the big unwieldy birds come fluttering, one after the other, all making for the sea. The Shag often sits very closely, the deafening roar of a gun in the cave not being sufficient to frighten it from its charge.

The following notes on the Shag have been furnished me by my friend the late Mr. Charles Doncaster:—

"Coasting this morning (June 12th) round the cliffs of Hoy, I came upon a little bay, close to the Cam of Hoy, and realized, as I had never done before, the countless number of sea-birds that were breeding here. There were hundreds, I believe thousands, of Kittiwakes' nests. In many places I counted twelve or more nests touching each other on one ledge. The lower ones seemed within reach of an oar, but the height is very deceptive: I landed and found they were nearly 30 feet above me. There were also immense numbers of Shags in every stage of plumage. I saw one upon its nest which looked almost accessible, and, with stockings only on my feet, managed to reach it. The bird, when she saw me, made most amusing menaces; she seemed to be trying to throw her head off at me, and erected the little bit of a crest which she had remaining from the full spring plumage. The nest, when I reached it, was much like a Cormorant's

both in material and smell. I found two young ones, very recently hatched, the broken shell being close by; they were naked, blind, and dark slate-coloured. The Shag is much more common here than the Cormorant. They are clumsy in diving from the rocks, seeming to go into the water anyhow; one I saw plunge nearly tail first! It would be hardly possible for an ornithologist to have a finer boating-excursion, at least in Britain, than that round Hoy Head in the breeding-season.

"Next day I visited the island of Copinshay. Large flocks of Shags were wending their way to this island, a flock of twenty or thirty, and then a space, and then another twenty or thirty, and so on, all in a line like Rooks returning to their roosting-places. There were a few Cormorants, which looked giants among the Shags, and generally flew higher than their smaller relations. The Shag often flies close to the water, so close that its shadow is exactly under it, and yet it never touches the water with its wings. The flight is wonderfully steady and straight. When I arrived at the island, I had the opportunity of seeing many Shags upon their nests. One had two young birds, and all the others, where I was able to see the eggs, contained two only. They not unfrequently have three eggs, and Mr. Dunn had one nest taken this year with four eggs, which is very unusual. I was amused with watching the gambols of the immature Shags and others not occupied on their nests. The ledges of Copinshay slope downwards to the sea and seem to be singularly ill adapted for the breeding-places of Guillemots, though so largely used by these birds. It is pitiable, when startled by the sudden discharge of a gun, to see quite a continuous shower of Guillemots' eggs fall into the sea. On one of these slippery ledges I watched a row of Shags, mostly immature. If another bird attempted to alight, he was generally pushed off again without ceremony: this was no difficult matter before he got a firm footing; but if he managed to withstand the first charge, he would probably have to encounter a second attack from two or three more birds on the ledge before being allowed to take up a position in peace. Two of them amused their small minds by fighting for the possession of a bit of stick, which neither in the least wanted; but each seized hold of an end and pulled lustily for possession, letting the stick drop unheeded as soon as the little game was over. How very like to some bipeds of higher organization!"

The eggs of the Shag, from three to four in number *, do not differ in any respect from those of the Cormorant, except that they are slightly smaller. They vary in length from 2·6 to 2·3 inch, and in breadth from 1·6 to 1·4 inch. The Shag often begins to sit on its eggs as soon as they are laid, so that young birds and nearly fresh eggs may be observed in the nest together. The female, it is said, performs the task of incubation. The young are carefully tended by their parents, being fed with half-digested

* Collett says that as many as eight eggs are occasionally found.

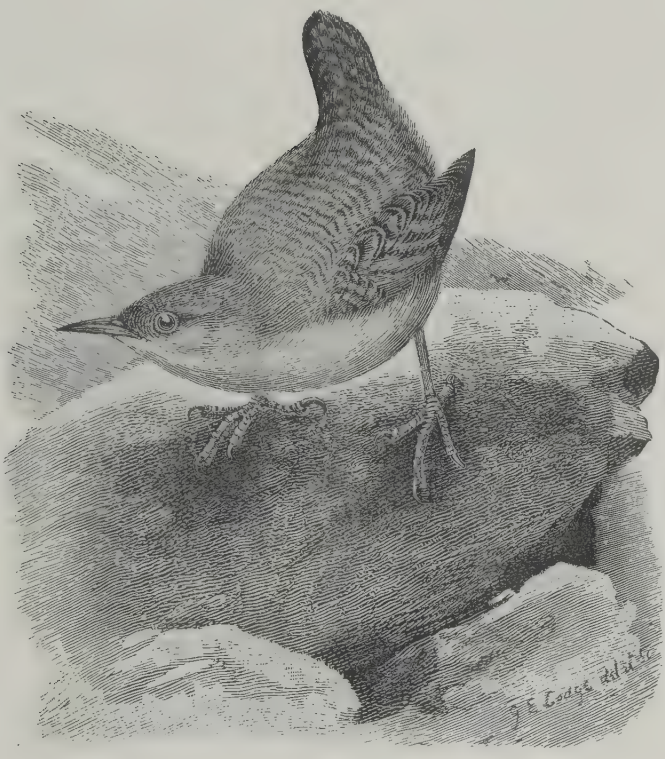
fish. They do not leave the nest until they are fledged, so that a vast quantity of fish has to be conveyed by the parents for their support. More fish are brought than can be eaten, and this, together with the birds' droppings, make a stench almost insupportable ere the young birds quit their birthplace.

The Shag does not wander far from its breeding-haunts in winter. It retires to its favourite cave to sleep or to shelter from the wild storms that sometimes confine it to its retreat for several days. When the sea is very rough the Shag usually stays at home, for it cannot fish very successfully under such circumstances. It does not often go far out to sea, always preferring to seek its food close in-shore, in the quiet bays and creeks or close to the rocks. Numbers of Shags may sometimes be seen sitting on some sea rock, preening their plumage or sleeping, and waiting for the tide to render their fishing-places once more suitable. When swimming they sometimes spread out their wings and hold them so for a considerable time. When rising from the water they splash the surface with their wings and feet, seeming to get into the air with difficulty. As evening approaches, the Shags, in silent strings, speed along just above the surface of the sea to their roosting-places.

The Shag is considerably less than the Cormorant. It is not known that there is any difference in the colour of the sexes. The ground-colour of the plumage of the adult after the autumn moult is black glossed with metallic green, very richly so on the head and neck, but only slightly on the wings and tail; the wing-coverts, scapulars, and feathers of the upper back have narrow black margins. Bill black, paler on the hook, and shading into yellow at the base; bare spaces at the base of the bill and round the eye black; legs and feet black; irides emerald-green. In very early spring a frontal crest of recurved feathers is assumed, which disappears after incubation has commenced. Young in first plumage and immature birds very closely resemble similar stages of the Cormorant, but may always be recognized by their shorter wings and by having only twelve tail-feathers. Young in down are nearly uniform brownish black.

The White Pelican (*Pelecanus onocrotalus*) and the Flamingo (*Phœnicopterus roseus*) have been shot in our islands; but as they are so extensively kept in confinement it is more probable that the examples obtained have been those of escaped birds than accidental wanderers from the basin of the Mediterranean, where both these species are resident. The egg of the former is figured on Plate 34, and that of the latter on Plate 61.

APPENDIX.



TROGLODYTES HIRTENSIS.

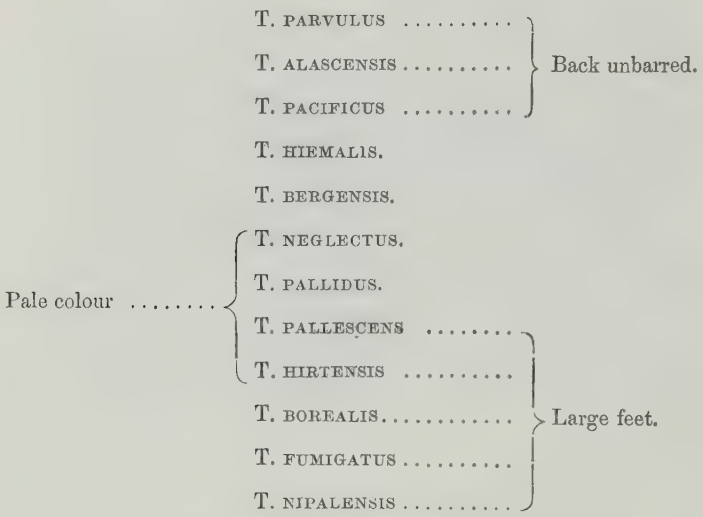
ST.-KILDA WREN.

Troglodytes hirtensis, *Seebohm, Zoologist*, 1884, p. 333; *Dixon, Ibis*, 1885, p. 80, pl. iii.

Since the article on the Common Wren was written, Mr. Dixon has visited St. Kilda and obtained an example of the Wren inhabiting that island, which differs in many important respects from the Common Wren of Europe. The Wren inhabiting the west coast of Norway has also been described by Mr. Stejneger (Zeitschrift ges. Orn. 1884, p. 10) as distinct under the name of *Troglodytes parvulus bergensis*. A third new species has also been added to the list from the Commander Islands in Behring Sea by the same distinguished ornithologist, under the name of *Troglodytes pallescens* (Ridgway, Proc. U.S. Nat. Mus. 1883, p. 93).

Mr. Stejneger, in his paper already quoted on the Common Wren and

its allies, objects very strongly to my having degraded these races of Wrens to the rank of subspecies. Since the article was written I have had an opportunity of examining many more specimens, and am still more convinced that in a large series from any one locality the extremes would be found to be indistinguishable from extreme examples belonging to the nearest allied subspecies. The main characters relied upon to distinguish the various races of Wren are the general colour of the plumage (which varies from brownish grey to rich russet-brown), the presence or absence of dark bars across the feathers of the back and breast, and the size of the bill and feet. The following table will point out the variations of the subspecies in these respects:—



It will be at once seen that the slight differences between these races bear little or no relation to geographical distribution. It is rather a remarkable fact that the nearest ally of the St.-Kilda Wren should be found on a group of islands subject to the same meteorological conditions, and in consequence equally characterized by the absence of trees. Similarly the Wren of Algeria scarcely differs from that of Turkestan. There can be little doubt that the races of Wren, like those of the Creeper, the Nuthatch, the Marsh-Tit, and the Coal Tit, appear to differ in colour according to climate and not according to geographical distribution, except so far as it happens to be connected with climate.

The Wren is one of those widely distributed and variable species of birds which are the despair of nomenclators. No fewer than a dozen races are known, and doubtless a dozen more remain to be discovered. A bird which is only migratory in the extreme north of its range and is found

in both hemispheres is soon subjected to the influences of many discontinuous areas of distribution. Each isolated area becomes the centre of a new race, which can only interbreed within itself and thus soon becomes slightly differentiated. Thus the Wrens of Iceland, St. Kilda, the Faroes, Behring Island, the Kurile Islands, Japan, North China, and Nepal have developed large feet, probably in consequence of living more on rocks than trees. Those of Nepal, North China, and Japan have become very dark in colour, a heavy rainfall accompanied by heat being apparently favourable to deep colour; whilst those of Algeria, Turkestan, and Cashmere, where the rainfall is exceptionally small, but the sun very hot, are remarkably pale. A very similar effect seems to have been produced in St. Kilda and Behring Island by exactly opposite causes, namely, plenty of rain but very little sun. Why the Wrens of Central Europe, England, and the Pacific coasts of North America should differ from the other races in having no dark bars on the back it is difficult to surmise; but neither with regard to this character, nor to any other which has been mentioned, can a hard-and-fast line be drawn.

The St.-Kilda Wren has been obliged by force of circumstances to change its habits as well as the colour of its dress. It would be interesting to know how many thousand years ago the accident happened which gave St. Kilda a Wren. Doubtless some flock of Norwegian birds migrating southwards to find a milder winter in Great Britain were driven out of their course and took refuge on the lonely Atlantic island, where their descendants, modified by time and circumstances, still survive.

Of the habits of this bird Dixon writes:—"The most interesting result of my trip to St. Kilda last year was the determination of its Wren, called 'Dhra-in-doun' by the natives. Although this little Wren was known to Martin nearly two hundred years ago, neither he nor any subsequent naturalist had the least idea that the bird was different from the Wren inhabiting the rest of the United Kingdom. It is very interesting to find such a delicate little bird isolated so far from the mainland, and frequenting such a wild rock-bound haunt; and its cheery song enlivens the bare hill-sides, even the gigantic precipices where the Fulmars rear their young. Viewed from the sea, St. Kilda looks far more barren and dreary than it really is. Not a tree or a shrub relieves the monotony of the bare hill-sides or even the sheltered valleys; but grass grows luxuriantly, making it literally an 'emerald isle,' and primroses, sorrel, and many other plants thrive on the cliffs and sloping banks. The hill-sides, even to the summit of Connacher, 1200 feet above the sea, are thickly studded with rough hovels, or 'cleats,' made of boulders and roofed with turf, in which the St.-Kildans dry their 'turfs' and grass, and where the sheep take refuge during bad weather. I had not been on St.-Kilda long before this little bird arrested my attention, as it flew from rock to rock, or glided with

great quickness and agility in and out of the crevices of the walls, its little tail held over its back, and with the constant bobbing of the head which makes the Common Wren so pert and engaging. It differs very little in its habits from its congener—it is just as restless, just as fearless; only, instead of hopping incessantly about brushwood or exploring roots and stumps and brambles, it has to content itself with boulders and walls. It was in full song, and I remarked that its voice is louder and more powerful than that of the Common Wren. I often saw it within a few feet of the sea, hopping about the rocks on the beach; and a pair had made their nest in the wall below the manse, not thirty yards from the waves. I also saw it frequently on the tops of the hills and in many parts of the cliffs. It was especially common on the island of Doon, where the Fork-tailed Petrels breed and the Puffins nest in countless thousands, its cheery notes sounding from all parts of the rocks. Its call-notes are loud and startling, similar to those of the Common Wren, but harsher. As there are no trees or bushes on St. Kilda, the Wren inhabits the luxuriant grass, sorrel, and other herbage growing on the cliffs, and picks its insect food from them. It also catches spiders and the larvæ of different insects in the nooks and crannies which it is incessantly exploring. Its young appear to be exclusively fed on insects. It is very fearless, and I used to watch a pair that were feeding their young in a nest not six yards from our door. Both male and female joined in the task. Its breeding-season must commence early in May, for the young were three-parts grown by the beginning of June. It makes its nest either in one of the numerous 'cleats,' or in the crevice of a wall, or under an overhanging bank. I had not the good fortune to obtain the eggs of this bird; but my friend Mr. John Mackenzie obligingly obtained them for me this season, and supplies me with the following note:—'The habits of the St.-Kilda Wren differ from those of the Common Wren. Its song is much louder, harsher, and has not nearly so many notes. Its favourite places for singing are on the tops of the "cleats" and the highest stone of the dykes or walls. It is particularly fond of nesting in the roof of a "cleat" and in the centre of a cairn. It lays six eggs only.' It is to be hoped that British naturalists will do their best to preserve and protect this little bird, one of the very few species peculiar to the British Islands."

A nest of the St.-Kilda Wren, taken in June this year, is domed like that of the Common Wren, and is composed almost entirely of moss, with a number of grass-stalks woven underneath the entrance, and is profusely lined with feathers and a quantity of hair. The eggs are six in number when the full clutch is deposited; they are pure white, profusely spotted, principally round the large end, with brownish red and a few paler underlying markings. Those in a second clutch were pure white without spots, and almost as much pointed at the large end as at the small end.

They vary in length from ·72 to ·69 inch, and in breadth from ·58 to ·55 inch.

Since last year five other examples of the St.-Kilda Wren have been obtained, in all of which the pale colour and the profuse barring of the back and the strong bill and large feet are very conspicuous. Unfortunately the half-dozen examples of this bird were all shot in June, and are consequently in somewhat abraded plumage. From residence in such an exposed locality as St. Kilda, a bird which only moults once in the year may fairly be expected to become considerably bleached by exposure to the sun, wind, and rain. It is possible that newly-moulted examples very closely resemble the race inhabiting Iceland and the Faroes, which, so far as is at present known, are supposed to differ only in being darker and more rufous in colour.

Except in having the bill and feet larger, the St.-Kilda Wren does not differ in size from the Common Wren. The female is slightly smaller than the male. In summer plumage the general colour of the upper parts of the adult is greyish brown, slightly more rufous on the upper tail-coverts and tail; below the nape each feather is transversely barred with dark brown, most of the bars being emphasized by the ground-colour being much paler below them; these bars extend to the wing-coverts, the innermost secondaries, the outer webs of the quills, and to both webs of the tail-feathers. The underparts and the streak over each eye are pale grey, each feather on the flanks, lower belly, vent, and under tail-coverts being barred with brown. Bill brown, paler on the under mandible; legs and feet pale brown; irides hazel. Young in first plumage and adults after the autumn moult are unknown. Its large feet, combined with its pale colour, suffice to distinguish it from all the other races of Wren except *Troglodytes pallescens*, from which it only differs in being a shade less rufous in colour, somewhat more distinctly barred on the upper parts, and slightly less so on the underparts.

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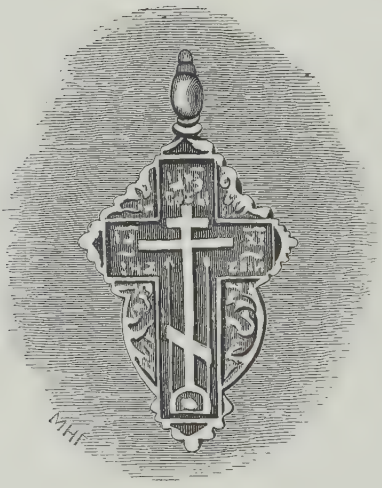

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